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PC PILOT

THE CREW

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SUBMISSIONS

We will gladly accept and review for publication any letters, articles, photographs or other contributions. We cannot guarantee publication nor, regrettably, return items sent to us or be responsible for their loss. We will try and reply where possible. Any letters are assumed suitable for publication unless we are otherwise notified.

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"Set the controls for the heart of the sun"

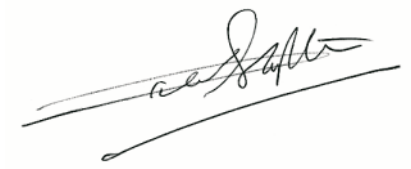
Editor's letter

Welcome to Issue 18 of PC Pilot. Thanks to our loyal readers we've now been publishing the world's favourite flight simulation magazine for three years. We had to think about that for a moment when we worked it out – three years? It doesn't seem possible! However, PC Pilot is still going strong and, despite the gloomy predictions when we took off, we still seem to have plenty to write about.

The summer is traditionally a quiet time in the world of software publishing, but you wouldn't think so after a perusal of our pages. With the new A320 from PSS/Just Flight and the B314 Clipper from Pilot's, the quality of expansions for Flight Simulator continues to improve. Likewise, the freeware community are keeping pace with the commercial publishers, and some of the software included on our latest cover CD has to be seen to be believed.

On the subject of CDs, one prediction we heard when PC Pilot was born was that traditional 'boxed' products would soon be a thing of the past. By now we should all be basking in the luxury of fast ADSL connections and downloading all our software from the Internet. How wrong we were! Broadband is still something of a rarity in the UK, and even Internet access is not as universal as we're led to believe. The trade-off is that you keep telling us how much you love our cover CDs and find them a lot more use for getting hold of software than a long phone call. The one on this issue contains a huge chunk of Lago's Europa TerraMesh, which we reckon will save those of us in the 56k majority a few pounds if we decide to buy a better Europe.

The only small cloud on the otherwise rosy horizon that stretches before PC Pilot is that, since we started, the potential rivals to Microsoft's crown as the king of non-combat flight sims have all but disappeared. Flight Unlimited III is unlikely to see a budget release, Fly! and/or Fly!II are looking for a buyer to rescue a potentially good product from the scrapheap of history and, apart from Xicat publishing an almost obsolete version, X-Plane seems set to continue as something for the enthusiast rather than the mass market. As we all know, a healthy sense of competition always results in improved products for everyone. However, the rumour mill continues its inexorable grind and it may not be long before another publisher steps into the departure lounge with a standalone sim tucked in his sporran. The next three years are going to be interesting – we're looking forward to flying with you to 2005 and beyond!



Dermot Stapleton
Managing Editor

COMMS

mail@pcpilot.net

FROM: Nigel Perry

I notice again in Issue 17 the debate on the merits of downloading freeware. Until recently I shared the reluctance to get involved, mainly due to the time involved in reading the text accompanying the file to ensure correct allocation of the files to the relevant directories. However, the cavalry has come to the rescue in the shape of a shareware program which I have only just discovered and have heard no mention of in your publication (please correct me if I am wrong) and am unsure as to how widely it is known. It is called Addit! Pro and apparently has been available for years; the latest version is available as shareware at www.byteforge.com. In a nutshell, it installs the download automatically from the WinZip folder, assigning all the files to the correct destinations, be they aircraft, panels, scenery, missions, sounds, textures or videos – and it really works! I can't believe how I managed without it. It now takes only minutes to have an aircraft flying, and I can wholeheartedly recommend this to all frustrated downloaders.

We reply:

We did include a shareware copy of Addit! Pro on our cover CD of Issue 15, and sang its praises in our article on installing downloads in the same issue, but are more than happy to give it another mention; it is, as you say, an exceptionally useful and time-saving piece of shareware.

And when they were up, they were up…

FROM: Ron Maskell

Many thanks for a great magazine. As usual I read it from cover to cover, but I was stopped in my tracks by the article on helicopter flying. I refer to the second paragraph on page 36 where it is stated the thrust from the main rotor is DOWNWARDS! It then goes on to state that to fly forwards the rotor is tilted forwards so that some of the thrust is BACKWARDS and then to slow down the rotor is tilted backwards so that some of the thrust is FORWARDS. This statement is supported in the velocity vector diagram where (with the helicopter tilted forwards) the thrust is shown downwards, resulting in the lift component going down and the forward vector (overcoming drag) going back. Surely this is all nonsense? The thrust should be UP normal to the plane of the rotor. This will produce a lift component going up (to counteract gravity) and a forward component (to counteract drag) going forwards. I reckon with the thrust going down aided and abetted by gravity the result would be quite a big pit! I hope Stephen doesn't take this personally; at least he can fly the thing which is more than I can do. Inspired by his article I am still persevering!

Stephen Heyworth replies:

Ron has a good and correct point. The thrust acting on a helicopter that is produced by the rotors is generally upwards, and is effectively the lift for a helicopter. The force on the air acts downwards and the force on the helicopter acts upwards. I was speaking more figuratively and meant the thrust/effect on the air rather than the thrust on the helicopter and hence the confusion. These two forces are equal and opposite, and are two ways of looking at the same thing.
I chose to look at it in the way I did because I anticipated more people would recognise the effect on the air rather than on the helicopter, so I hoped it would be clearer that way (as it seems, do Bell).

Rotor thrust? It all depends how you look at it

FROM: Mark Lewis

I have been flying sims for the past six years, and had always wanted to fly for real but couldn't afford it, and so I treated flying on a simulator as the next best thing. In March of this year I found the cash and began lessons at my local airfield. I am progressing well and went solo in just over nine hours. The articles I've read in your magazine and the countless hours of practice spent on the PC have stood me in good stead for the real thing. My general handling, understanding of instruments in the cockpit and aviation terms have meant fewer hours on the ground with my instructors and more time in the air honing those skills, at a considerable financial saving. Thank you for a great magazine and the 'leg-up' you have given me towards my PPL. I would urge all readers who haven't flown for real to take a trial lesson – you will be surprised at how much you already know about flying for real.

Sims as training tools?

We reply:

We ran a feature on the use of flight sims and the PPL back in Issue 12 and the reaction from flying instructors was very mixed. However, the conclusions of those who dabble in flight sims and also fly are generally very positive, and certainly bear out Mark's experience. Time to start saving for your wings!

FROM: Tony Storey

I am delighted that there is at last to be a Dam Busters add-on for CFS. It promises to be excellent. I have one minor complaint. Your picture on page 15 of Issue 17 shows a Lancaster BIII Special with the caption 'A Grand-Slam-equipped Lancaster over RAF Scampton'. In August 1943, 617 Squadron moved from Scampton to Coningsby (included in the BBMF add-on) and then to RAF Woodhall Spa in January 1944, where they remained for the rest of the war. It was from here that Grand Slam and Tallboy (5-ton bomb) raids were launched, not RAF Scampton. Just a minor point, but I thought it was worth mentioning.

We reply:

We understand from Just Flight that they are aware of 617's various aerodrome locations, and their briefing notes to the press on the The Dam Busters made this clear:

Scenery notes: Due to the fact that we have already published RAF Coningsby in a modern form (BBMF) we have not included it in The Dam Busters. The V1 ski sites raid was flown from Coningsby, but in The Dam Busters we have started this operation from Woodhall Spa, a satellite airfield of Coningsby. It is not easily feasible to include a WWII version of Coningsby, and we have also decided not to include RAF Scampton in FS2002 as this 'slot' may be used for another upcoming project.

Our apologies if our caption led anyone to think that the Grand Slam aircraft was based at Scampton rather than Coningsby, although we understand from the technical department at Just Flight that this type of information will be included in the manual for The Dam Busters. The constraints of the various host simulations and the need to make products cross-platform between FS and CFS is always likely to lead to some compromises, and we generally take this into account when reviewing add-on software.

It's flying over Scampton…but it took off from Woodhall Spa!

NEWS

Need some assistance, Sir?

Brian Tooby has recently released the latest version (v1.6.4) of his popular Pilot's Assistant Toolset, which requires nothing more complicated from your PC than Microsoft's Excel spreadsheet software. A useful training aid and reference utility for virtual pilots, it's designed to help with flight planning, navigation and various calculations and conversions, from QNE/QNH/QFE altimeter settings and a fuel planner to wind corrections, climb and descent calculations and much more besides. Not only does it provide easy access to a wealth of information, but it's competely free, and can be downloaded from http://www.tooby.demon.co.uk/P_Assist_Home.html

Also on the site is the Pilot's Assistant Directory, with enough links to satisfy all your cravings for FS, aviation and PC information. The site is updated regularly, and we can recommend it as an invaluable reference source.

One flight forum

A funny thing happened on the way to the forum. Actually, it didn't, but it gives us an excuse to mention a funny film title! If you fancy yet another place to natter about flight simulation and also find out what's on the radar at US developer Flight One, try their new forum at www.simforums.com.

SimForums ...A Service of Flight1.com

Virtually up again!

After a long break, VirtualAviation's popular simulator fun flights are back, and they'll be using the Boeing 747-400 full-motion simulators at British Airways' Cranebank simulator centre at Heathrow Airport. Not surprisingly, they have built up a large backlog of people waiting to book, so dates will fill up very fast. Take Fred Pontin's advice and book early! For more information call 01223 300300 or visit www.virtualaviation.co.uk

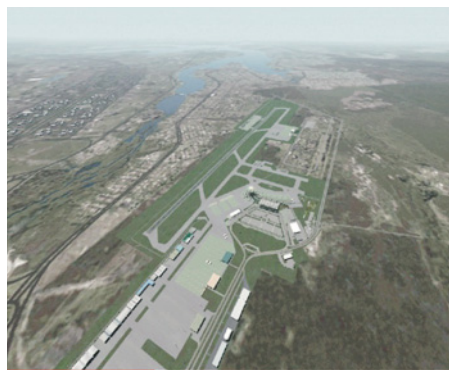
de HAVILLAND AIRCRAFT HERITAGE CENTRE

With interest in the Mosquito recently reawakened by Just Flight's Mosquito Squadron release, we thought it an appropriate time to mention the de Havilland Aircraft Centre, which incorporates the Mosquito Museum and remains the UK's oldest aircraft museum. It stands next to the historic Salisbury Hall in London Colney, where the revolutionary Mosquito was developed in 1939, and contains a number of de Havilland aircraft, amongst which are several Mosquitoes, including the prototype. The collection also includes the Vampire T.11 and FB.6, Queen Bee and Tiger Moth, Sea Venom and Sea Vixen, Horsa glider, Dove, Heron, Comet and Trident. Sadly the museum's Comet 4 simulator, used at one time by BOAC and Dan-Air, is no longer functional.

The Heritage Centre has an ongoing restoration programme, and is open from March until the end of October, on Tuesdays, Thursdays, weekends and bank holidays; call 01727 826400 for opening times and details of their regular displays and events. Situated literally minutes from junction 22 of the M25, it couldn't be easier to find, and is yet another shining example of dedicated volunteers working hard to preserve a valuable part of our country's aviation heritage. We were made very welcome, and can't think of a better excuse to get away from the M25 traffic jams.

REAL FLIGHT AIR SHUTTLE EXPRESS

The skills of the Brazilian football team need no further comment, and now Real Flight are putting Brazil on the FS map with the release of their Air Shuttle Express – Pack 1 for FS2002 ($24.95 boxed, or approx. £17.00). As well as the VARIG LOG DC-10-30F Cargo and the first part of a book exploring the history of aviation in Brazil, Air Shuttle Express includes scenery for the capital, Brasilia, its President Juscelino Kubitscheck airport and three other airports. VARIG LOG is the largest Brazilian logistics company, and has worked in conjunction with Real Flight to get the project off the ground. Spectacular scenery of Rio de Janeiro and ten accompanying airports are promised soon for Pack 2, but in the meantime see www.realflight.com.br for more details.



FULL MOTION FOR YOUR FRONT ROOM

The idea of a full-motion simulator that you can use at home is something of a holy grail for flight simmers, and we occasionally get mail from readers asking if they can buy such a device. Well, the search is over.

Walter Noon, an American-based designer, has developed a machine he calls the Virtual Flyer, which he says has been specifically built to be affordable for arcades, festivals, trade shows and the PC community. The machine itself is still in prototype form, but Walter reckons he has solved most of the design issues and estimates that he could probably build you one for about $10,000 (£6,400 approx.) It sounds expensive, but against the $14m you might pay for the sort of thing the RAF uses it's pretty cheap.

Unlike other systems we've seen, the Virtual Flyer uses a program developed by Noon and J-Omega Electronics to track the background scenery and translate this into movement provided by pneumatic cylinders. The effect is said to be highly realistic. No clues yet as to when you'll be able to buy one in Game, but we've cleared some space in the office, just in case. Visit Walt's website at www.noonco.com and see for yourself.

NO MORE BROKEN LINKS!

MSFS Gateway
Pages of Microsoft Flight Simulator Links
www.msfsgateway.com

If the Favourites folder in your Internet browser has got out of hand, you'll be relieved to hear about the MSFSGateway website (www.msfsgateway.com).

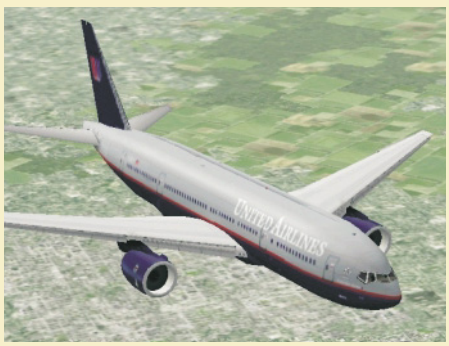
Arguably the best FS links site available, it contains illustrated and categorised links to over 300 Microsoft FS-related sites, and is regularly updated and maintained. The site was created by Tony Smith after frustration at broken links and defunct sites got the better of him, and the site summaries are guaranteed to make life easier, whatever your particular area of FS interest. National, regional and foreign-language sites are all listed, and serve as a reminder of the healthy global state of flight simulation on the Web. There's even a similar site for X-Plane fans at www.xplanegateway.com.

Dive! Dive!

Congratulations to the new recruits to the Kriegsmarine – the winners of last month's Silent Hunter II competition. The German Unterseeboot not surprisingly means underwater boat, and the Fairey Swordfish was known as the Stringbag. The winners were Adrian Staunton, Colin Paxton, Geoffrey Willis, Keith Bachelor, Philip Mulhaire, Tony Rice, Richard Smith (USA), Andy van Steenis (The Netherlands), Chris Butler-Stroud, Henrik Dissing Andersen (Denmark), Ken Jagger, Mark Harman, Peter Dobromylski, Stephen Hartshorn, Robert Bell (Canada), Michael Dolby, Robert Pountney, Kenneth McCrea, HJ Smith and John Merriman.

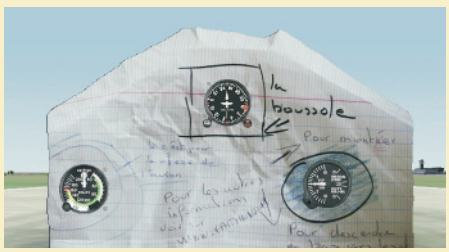
Phoenix rises (at last!)

The long-awaited patches to make the PSS 777-200 and 747-400 compatible with FS2002 are finally available. These two popular airliners were originally developed for FS2000 and published commercially by Just Flight. The patches should grant them a new lease of life in FS2002, and many of you who have written to us asking for news will be able to get airborne again. If you purchased the boxed version, go to the support section at www.justflight.com or, better still, you'll find them included on this issue's Cover CD. Owners of the download version can find the patches on the PSS support forum at www.avsim.com



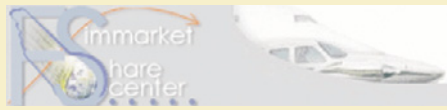
Back to basics!

Anyone who fancies a little light relief from airliners and complex panels might like to try the gmax-created paper plane from the French FS site www.faitmain.com. It's even got a paper panel! Just follow the 'Télécharger l'avion en papier' download link and install it in your FS2002 Aircraft directory to remind yourself of how simple it all used to be.



Sharing a shop

Miguel Blaufuks of simmarket.com has been telling us about his great new online 'shop'. By merging the old simmarket site and the fssharecenter he says that anyone wanting to buy by wire (we like that phrase) is going to get an even better service with immediate and automatic file and key delivery, not to mention the ability to purchase in Euros. The site is certainly easy to get around, and our 'secret shopper' test purchase went without a hitch. Get downloading at www.simmarket.com



A link of Epic proportions

Once you've evicted your granny from the spare room and got it ready for that cockpit building project you've always wanted, the next obstacle is how to get all those complicated key commands handled by switches and levers on your cockpit panel. The answer is an Epic card, which will convert analogue switch clicks into keyboard strokes. You have got to program the card, however, which is no mean feat. Help is at hand with the impending release of EpicMapper. This handy-sounding piece of software is designed to take over all the interfacing between your cockpit and simulator program. We're also told it works with Project Magenta software. More details at www.epicmapper.com

EPICMAPPER

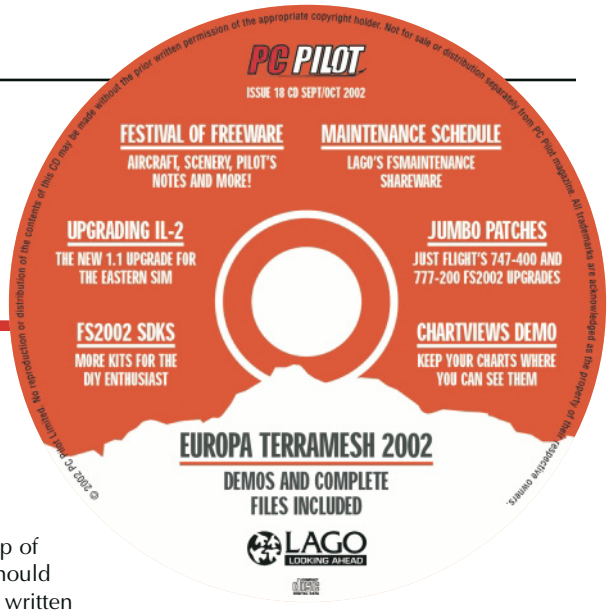
Lock On – not yet

There's some disappointing news for all of us who are eagerly awaiting the release of Ubi Soft's Lock On: Modern Air Combat – the release date has been put back to January 2003, as apparently more development time is needed. If an improved and bug-free sim is the result, it'll be worth the wait. More details, as always, from www.lo-mac.com

Bytes and bikes at UK show

The confirmed date for the premier UK FS show, at Birmingham's National Motorcycle Museum at the NEC, is Saturday 23 November. Word has it that IL-2 creator Oleg Maddox will be in attendance, along with all the usual FS suspects, and that an extra hall has been booked to provide a greater area than was available last year. Keep an eye on www.rcsimulations.com for a list of exhibitors as they confirm attendance.

COVER CD



GETTING STARTED

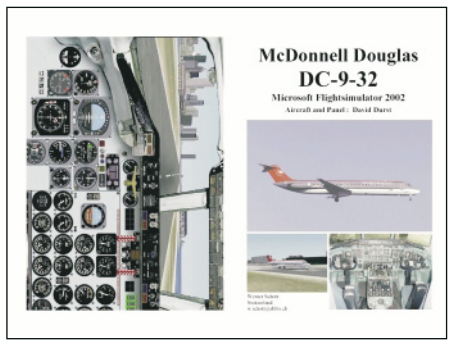
To get the CD running, close all programs and applications and place the PC Pilot CD in your CD-ROM drive. If Autorun is enabled, the program will start and you will see the opening screen and menu buttons. If you don't have Autorun activated, or the CD doesn't start automatically, press the 'Start' button on your Windows taskbar, move up to 'Run' and left click on it. Type in the 'Open' window: D:/issue_18 (where 'D' is the drive letter of your CD-ROM drive), then press OK and the menu should appear. If the buttons don't work or it won't autorun it probably means that your CD drive is not designated as 'D'. In this case, go to 'My Computer', right click on the CD icon and select 'Explore'. You should then be able to open up the folders as required.

FREE(WARE) AS A BIRD

Once again we have to extend a huge thank you to the dedicated developers of freeware who have donated an absolutely fantastic crop of great files for our cover CD. This should please the many readers who have written to us saying how much they look forward to installing the freeware from CD rather than downloading from websites. Our latest selection is, we think, an impressive one. There's an amazing CM170 for the Star Download and among the other offerings is a huge selection of files for FS98 and also 20 manuals and checklists for some of our favourite aircraft, not to mention some nifty freeware for Flight Unlimited III. There's no such thing as a free lunch, but the selection we've put together is a free feast!

EUROPEAN SCENERY WITHOUT ANY MESHING ABOUT!

If you've read our review of Lago's new TerraMesh scenery elsewhere in this issue, you might fancy the chance to pack some virtual sandwiches and take a trip across a brilliantly detailed Europe. However, it weighs in at 190Mb for all three areas, and if you haven't got a broadband connection or the time to download it, you might decide to give it a miss. Fear not – help is at hand! For this issue we've teamed up with Lago to put the first releases in their TerraMesh series on our cover CD. So that you can see just how good this scenery is, Lago have also given PC Pilot readers an exclusive chance to sample the demo versions of TerraMesh on the CD and you can also try the highly acclaimed shareware program FSMaintenance. Full details are on page 10.



PATCHED-UP AIRLINERS

The long-awaited patches are now available to make the PSS 777-200 and 747-400 work in FS2002. We've included the ones for the boxed version (published by Just Flight) and an updated panel operations manual for the 777. We've also got a handy little checklist and procedures file that Eoin Sutton created when the 747 first came out. It was verified and approved by a retired 744 captain and should be useful.

UPGRADE YOUR STURMOVIK

Ubi Soft has released a free upgrade for its award-winning WWII combat title, IL-2 Sturmovik, in conjunction with game developer 1C:Maddox Games. The 1.1 upgrade will include ten new planes and a number of improvements to this brilliant sim. We have included the version that requires the 1.04 patch to be installed first (this was on the Issue 17 CD). Full details are at www.il2sturmovik.com

THE TOOL CHEST

SDKs FOR FS2002

The take-away pizza emporiums in Seattle must be having a lean time of it, because the Microsoft developers have been working their socks off. Hot on the heels of the SDKs we included in the last issue are another six that cover tricky stuff such as multiplayer flying.

gmax FOR BEGINNERS

To go with our second article on the all-singing design tool gmax, we've included Microsoft's tutorial on scenery and also a rather important file. To get stuff from gmax into FS2002 you use a utility that's included with FS2002 called MakeMDL.exe but unfortunately it has a few nasty bugs. There is a fix available, however, which we have included on the CD. When you run the gmax_scenery_tutorial you'll also find a file called make.mdl, and this is the one you'll need.

UTILITIES

CHARTS

The charts for our latest tutorial are included on the CD in PDF format. If you have any trouble accessing the charts go to My Computer, right click on the CD icon and select Explore. We've also included a complete glossary of the symbols used on the charts as a PDF file in the charts folder. To view this, or the Jeppesen charts used for our tutorials, you'll need Acrobat Reader, which is also included on the CD.

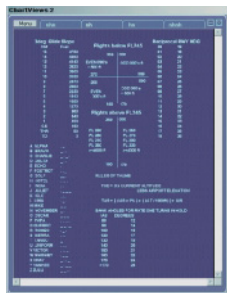
FULLSCREENGAUGES

Here's a useful bit of freeware called Fullscreengauges that was kindly donated by Derek Swanson. It operates with FS2002 and enhances the set of default gauges seen in the 'full screen' view. If you enjoy VFR flying with minimal panel intrusion or use third-party aircraft without virtual cockpits, this enhancement helps improve control on take-off, approach & landing. The installation instructions are contained in a very good readme file inside the Zip. Many thanks, Derek.

FSUIPC

Here's the latest version (2.87) of Peter Dowson's ever popular FS utility. This excellent program, regularly updated by Peter, comes with a complete manual in PDF format that puts many commercial offerings to shame. Clear, concise and well written, it should answer any question you could ever think of about FSUIPC. Worth a look if you've ever wondered what FSUIPC is all about. Just open the Zip file and read the User Guide. We've also included the new FSUIPC SDK for those that like to tinker. Thanks, Peter!

CHARTVIEWS



ChartViews 2 is a small standalone shareware Windows utility for flight simulators, which allows a number of airport charts to be stored and made available on screen during your flights. It was written by Alex and Stuart Hyett (www.xhytex.com/chartviews) and Alex has kindly sent us a demo version for PC Pilot readers to check out. There's a full HTML manual in the ChartViewsDocs.zip which you'll need to extract to use the program correctly. Just open the Zip file, extract 'all files' and tick 'use folder names'. Then click on the HTML file and read the manual. It's restricted to a single chart display and a time limit of 10 minutes, but it gives an impression of what the programme does. The full version is available for purchase at €10.00 and you can get it from www.fssharecenter.com/chartviews

WINZIP & ACROBAT READER

You'll need these important utilities to open up Zip files or read PDF files. Please note that any shareware should be paid for and registered if you want to use it on a regular basis.

IMPORTANT - TECHNICAL SUPPORT

The CD and software on it is free and as such, neither PC Pilot, nor any of the publishers or developers of the software supplied on the CD can provide technical support. The software is supplied very much 'as is' and without support. Enjoy the CD and the software on it!

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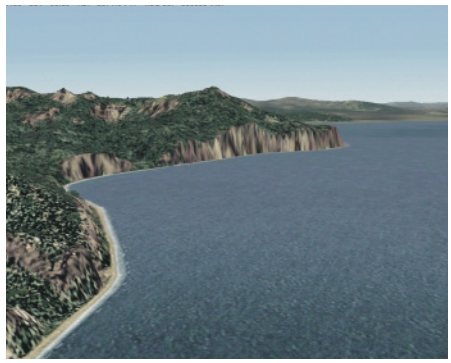
The Scenic Route

TerraMesh Europa 2002

Two hundred megs of TerraMesh!

Here at Lago we're really pleased with the fantastic reception that both the press and the public have given to our new TerraMesh Europa scenery. Everyone is raving about how we've made Europe come to life, and this is a must-have for anyone who's serious about their scenery. Each area weighs in at around 70Mb each, so downloading them might be a bit of a chore if you haven't got a fast connection. Luckily, help is at hand with the PC Pilot CD, and on this issue's cover disc you'll find the complete TerraMesh files for Switzerland, Northern Italy and Austria. We know that PC Pilot readers are a discerning bunch, so we've also included two free demo areas of TerraMesh so that you can see for yourself what all the fuss is about. Take a free flight around Mont Blanc/Geneva and Sardinia/Corsica with our compliments.

If you decide that you want to buy, just follow the links or go to www.lagoonline.com for more information. Each area is priced at a very reasonable e5.00 each, which is about £3.00. That's a huge chunk of Europe in all its glory for under a tenner, and without the bother of a download. Don't wait for a referendum – become a part of Europe today!



How do I get loaded?

To access the files all you need to do is to click the Lago CD button on the front page of the CD menu. Then click on the 'Launch LAGO Browser' button and it will take you to an information page about our TerraMesh Europe scenery. There are some links that let you load the zipped installer and also take you straight to our website so that you can purchase a serial code and start exploring Europe. You can also load the TerraMesh demos for Mont Blanc–Geneva and Sardinia-Corsica scenery areas. Elsewhere on this page you'll find everything you need to know about FS Maintenance and a try-before-you-buy version of this must-have flight simulation software.

LAGO LOOKING AHEAD

FSMaintenance

A try-before-you-buy version of Lago's popular FSMaintenance

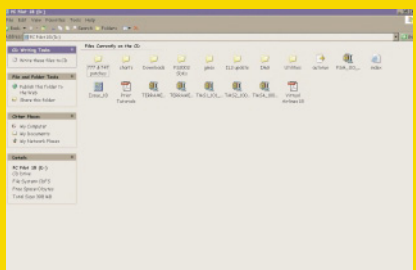
Modern commercial aircraft are incredibly complex machines, and it is mind-boggling that they are as reliable as they are. As a passenger, you might be upset about a reading light that doesn't want to work, but if you look outside, you will see a turbine engine that is scheduled to run for years before the manufacturer claims it might fail.

It stands to reason that regular maintenance will keep you airborne, but it doesn't come cheap, and operating a real fleet of aircraft is quite a task for accountants as well as engineers. Now you can see for yourself how much work is involved and pit your skills against the ravages of time and distance on your aircraft. FSMaintenance brings the fourth dimension to Flight Simulator 2002. You'll be able to see the effects that those heavy landings have on your maintenance budget and you'll come to dread the winking of a warning light that wasn't there a minute ago.

The trial version of this amazing new expansion for Flight Simulator 2002 is included on the CD. Just follow the links and see if you've got what it takes to keep those planes flying!

To D: or not to D:?

The PC Pilot CD is set up to search for files in D: and assumes that your CD drive is designated D. If it isn't, go to My Computer, right click on the CD icon and select Explore. You'll find all the TerraMesh and FSMaintenance Zip files in the list of folders.

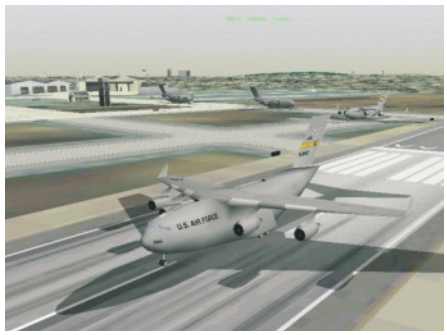


Falcon

Operation Infinite Resolve

The legend continues

"Goose…Goose…where are you?"



There were more than just Falcons in Falcon 4.0!

"Would you care to see a menu, Sir?"

Among the many offerings being touted at the E3 software show this year was a familiar face that will strike a chord with many flight simmers. Yes, Falcon is back and the oft-promised Falcon 5.0 (Falcon V?) is still on its way. Unfortunately for Falcon fans (and there are many of us about) the fifth incarnation of this popular jet combat sim is running a little slower than Mach speed and is unlikely to appear on your PC much before Christmas 2003. However, the signs are that the current owners of the Falcon licence mean business, and work seems to be progressing well. We previewed Falcon V back in Issue 12 and at the time it had just been acquired from Infogrames (who took over the remnants of Microprose). There isn't much more flesh on the bones from when we last looked, but G2 Interactive (the owners) and their development studio are promising to release a new version of Falcon 4.0 as a stop-gap that will be available (they say) by the end of this year.

Called Falcon: Operation Infinite Resolve, and conveniently abbreviated to OIR by us and many others, it promises to carry on where Falcon 4.0 left off. As well as flying an F-16, OIR pilots will also be able to take to the air in the A-10 Warthog and create mud-moving havoc with its 30mm cannon. There's going to be a new Korean theatre campaign (does George Bush know about this yet?) and, as well as dynamic campaigns, there'll be a full single-mission and campaign editor so you can plan your own raids around the world. More emphasis on the multiplayer aspect should ensure that the huge Falcon community welcomes OIR with open arms.

The main difference between OIR and Falcon 4.0 seems to be an absence of the bugs that plagued the original, as well as DirectX 8.1 capability and the ability to use hardware acceleration. Put simply, the only way to get Falcon 4.0 running more smoothly was to use a faster processor. However, in OIR you will be able to make more use of the graphics card's processor and take advantage of 'modern' technology to improve frame rates.

There's also a new pilot training program which should serve to answer one of the biggest criticisms of Falcon 4.0 – the difficulty of getting started. Understandable, when you consider that the world's air forces take more than five minutes to train a combat jet pilot, but this level of realism was the final nail in the coffin for flight sims from the perspective of big games publishers. When we interviewed the G2 team at E3 they seemed very gung-ho about the prospects for Falcon: OIR, although screenshots still seem quite thin on the ground. Many of us are looking forward to taking the A-10 up for a spin, so let's hope that the only hot air is coming from the afterburners! ■

Derek Smalls

No, not a wingless Warthog – this is a tank planned for Falcon V

Better graphics are promised for cockpits as well as exteriors

Preview Information

Publisher: G2 Interactive
Price: TBA
Website: www.g2interactive.com
Developer: Force 12 Studios
Expected Release Date: late 2002

A320 Professional

Computerised cruise control

From time to time a flight simulator add-on comes along which forces you to re-assess your critical standards, and which tosses aside your expectations. Such products are rare, but when it comes to Phoenix Simulation and Just Flight, they appear to be second nature. What are we talking about? Their latest fleet edition, the A320 Professional, of course...

The design of the Airbus A320 family is a radical one; it incorporates concepts never before seen nor attempted in commercial aviation. This is the first airliner to abolish the conventional control column and opt for a neater, more modern sidestick, much like the joysticks we use for flight simming. It also features the famous fly-by-wire computerised flight control system, making the aircraft easier to handle while further increasing safety. Many people inevitably become confused by the term 'fly-by-wire', but what it actually means is that the flight controls of the aircraft are moved (by the sidestick) through electrical signals, replacing the traditional mechanical control column to control surface linkage. One of the great virtues of this system is that it is impossible for a pilot to manoeuvre the aircraft outside the flight protection envelope, so essentially the A320 cannot stall, overspeed, or bank too quickly or too much. Coupled with its unrivalled fuel economy, common type rating and small noise footprint, it's no wonder that the A320 is now the worlds favourite single-aisle airliner.

Intricate modelling wherever you look

The A320 Professional package from Just Flight contains the Phoenix Simulation Software A319/320/321 aircraft, an A320 flight deck video and, most importantly, printed manuals, charts and tables. We were eager to discover how PSS had risen to the challenge of recreating the world's most sophisticated commercial jet plane and implementing its advanced electronic systems – not an easy task.

Grace and sophistication...on wheels

The visual models are exceptional and really deserve a shiny box of their own. PSS are known for their detailed aircraft exteriors and this is no exception; Graham Waterfield, the aircraft designer, has done a

remarkable job here. The planes are near-exact replicas of the real jet; the fuselage is a perfect shape and everything you would expect is there – smooth moving control surfaces, spinning wheels, compressing struts, Airbus-style reverser cowls... you name it. Basically, if it moves, you can move it. You can even see the hydraulics underneath the spoilers and, to top it all off, the two main cabin doors open (but for the lives of us we couldn't get the cargo bay hatches to do the same).

The package comes with a total of 35 liveries that vary across the A319, A320 and A321; these include some US airlines, such as US Airways and Northwest, and Air Canada is in there too. The artwork is exceptional – the liveries are painted with painstaking detail and the textures are superb, all in crisp high resolution. Also included are reflective textures, which are a neat addition. These models are some of the finest we've ever seen for Flight Simulator.

PSS have also managed to implement two different engine configurations, IAE and CFM. The IAE engines are the more cylindrical type to look at, but the main differences between them are the engine readouts on the panel. The primary readout for IAE engines is EPR (Engine Pressure Ratio) and for CFM it's N1. A nice addition to the package, as not all airlines (notably British Airways) use the CFM configuration.

The REAL glass cockpit

Now to where this aircraft really shines: the flight deck. The first thing you will notice is the height of the panel; it covers more than three quarters of the screen. We've seen some IFR 2D panels in our time, but this seems way over the top. Don't worry, though – it's not some overlooked design flaw, but merely PSS' attempt to recreate a pilot's eye view of the Airbus cockpit. It has allowed them to correctly position the four primary glass screens, all of which are essential to manage this bird. Thankfully, they also included a VFR 'compact' panel which we predict will be used frequently, simply to enable you to see outside.

PSS have used their trademark panel graphics in producing this flight deck; it works, but we felt that this area was slightly lacking compared to the efforts of other developers using high-resolution bitmaps. The four CRT (Cathode Ray Tube) screens display a vast amount of information, from critical flight data and cabin altitude to the power output of the engine generators. Implementation of the displays is faultless, right down to the flight path director bird and command 'moustache' on the Primary Flight Display.

Route information is displayed on the ND (Navigation Display) which has five modes and two ECAM (Electronic Centralised Aircraft Monitoring) screens providing

You'll find the manual essential!

Now you know why the A320 can get complicated. The overhead panel contains many interactive elements

Brown night lighting...? Yes, we're thinking the same thing...

engine readouts, warning messages and aircraft status pages. The upper ECAM contains the Engine/Warning display, showing critical engine readouts and even an animated display of flap deployment, while the lower ECAM has 11 different screens available, ranging from hydraulic readouts to brake temperatures. This wealth of information may well bewilder the casual flyer, but will no doubt delight the hardcore enthusiast. Unfortunately, this is where our first criticism arises; the displays can be hard to read at 1024x768 and we often found ourselves squinting to read the ND. Thankfully, PSS have included larger, moveable gauges for the PFD, ND and ECAM; simply click on the screen and they will pop up. These can be moved to another monitor, which is a nice bonus for those with multi-monitor setups.

The Airbus's Flight Control Unit is also present, much like the Boeing Mode Control Panel, except it adopts a push/pull procedure instead of the single button press. It takes a while to get accustomed to the knobs – all this pushing and pulling left us a little confused at first – but mastering this is essential. The overhead panel contains some usable systems, such as fuel, electrical and to some extent, hydraulic, but for the most part it's artwork. This won't please the purists but, considering the relatively small market for ultra-realistic aircraft, PSS has maintained the right balance to suit both casual flyers and diehard veterans. The throttle control is placed along with the radio panel, but this is no ordinary throttle. It is fixed for a series of detents or 'gates', activated through the use of the [+] or [-] keys, so once the levers are placed at any gate, the computer takes over control of the thrust, maintaining engine efficiency and fuel economy.

The virtual cockpit is highly detailed, and the only item missing was the route information on the ND, though this is not PSS' fault; some interactions between the advanced panel architecture and the VC are not possible. Those of you who fly regularly with the VC will be delighted rather than disappointed!

Head of Management

The heart of the Airbus is undoubtedly the flight management computer (or Multi-Function Control and Display Unit, in Airbus-speak). Once it's fully programmed, it can control the aircraft from just after take-off to touchdown, with autoland if desired, without the need for pilot intervention. While these devices are a minority interest among flight simmers, they do have their devotees, but flying the 'bus without the MCDU is like driving a Mercedes without the logo on the bonnet – there's just no point.

We won't go into the intricate details, but for the Airbus to reach its full potential, you must program it fully. Many functions are modelled, and the graphics for the FMC are clear and crisp. Boeing FMC veterans making the changeover will have to do their homework because, although the basics are the same, the principles are different. Once you have initialised the aircraft you must program your route on the F-PLN page, enter your Zero Fuel Weight and Block Fuel, calculate V speeds (although this is automatic) and configure the take-off page – all this in the interests of fuel economy and flight safety.

The fuselage is a near-perfect shape

The airlines' favourite

One of the 35 detailed liveries included

The flight test

The flight models are right on the mark for this class of airliner, thanks to the workings of PSS' Johan Dees. The 320 is responsive and flys very smoothly, by the numbers.

The main 2D panel is a sight to behold

The VFR compact view...a very handy addition to the package

When it comes to autoflight, the Airbus does what it is supposed to, assuming you have programmed it correctly, and does it well. Unfortunately PSS were unable to model the advanced safety system redundancy (called Abnormal Law) and it's still possible to stall the aircraft, bank too much and operate beyond the safety envelope. All Airbus variants will taxi on idle thrust, unless they are abnormally heavy, and the aircraft will autotrim; even on take-off little pilot input is required.

After departure, responsibility is handed to the computer and you begin reducing thrust to reduce fuel burn. The autopilot follows the flight path precisely, even in a heavy crosswind. Normal Law is also modelled, which means pitch is always kept in trim automatically; if you bank the aircraft to any degree, it will maintain that exact bank angle and not return to neutral. During climb and cruise, speed and altitude are captured and maintained precisely – the sign of a quality package. We did notice slight, but noticeable, pitch up/down motion in cruise with each aircraft; PSS support put this down to the soft altitude capture of the Airbus.

As far as fuel flow is concerned, the figures are accurate (as far as we can tell) and a fuel prediction at destination is available from the MCDU. The MCDU even calculates the correct descent and de-acceleration points for the approach, but this always seems to be around 12-15nm from the airfield, so manual control of speed is useful. Localiser and glideslope capture was problematic for us at the best of times, but when we did become aligned they were maintained well. Overall, autoflight calculations are as exemplary as they are in the real aircraft.

Airbus-style CFM reverser cowls. Fantastic attention to detail

The CFM56-5 turbofan, one powerful powerplant of the A320 family...

...and the IAE V2500, both modelled with precision accuracy

Outstanding

A320 Professional is a remarkable product. The attention to detail is exemplary, on not just the model, but the panel and subsystems as well. The aircraft are a beauty to fly, and the advanced autoflight system has been implemented outstandingly. We debated for a long time whether to award this product four or five stars, but we noticed nothing that could be considered as a major flaw. Even though the casual simmer will be daunted by such an add-on, once you get to know this Airbus you'll enjoy it immensely. The added inflight video (available in PAL or NTSC) and printed manuals and tables are simply the icing on the cake. This truly sets the standard for simulated versions of the Airbus. ■

Eoin Sutton

Review Score

Publisher: Just Flight

Price: £34.99 (including video)

Website: www.justflight.com

Developer: Phoenix Simulation Software

At a glance: The definitive Airbus for Flight Simulator. Once you get to understand it, it's a joy to fly, with excellently implemented systems.

System Requirements: PII 600MHz, 128Mb RAM, 16Mb 3D graphics accelerator card, 700Mb hard drive space

Recommended: PIII 1GHz+, 256Mb RAM, 64Mb 3D graphics card

A realistic A320? The pilot speaks!

Time to get technical...

When I was first asked for my thoughts on Just Flight's A320 add-on, I expected just another Airbus-lookalike cockpit with improved external graphics. Within the first few minutes of using the program, it was clear that this was to be a very different story.

Any serious attempt to represent the A320 must emulate the PFD (Primary Flight Display), ND (Nav Display), and FMGC (Flight Management and Guidance Computer) and their interaction. This package does all of this and more, including also the ECAM (Electronic Centralised Aircraft Monitoring) system pages, and a working overhead systems panel. Most pilots would have a three-week course to learn all this, so persevere and it will all make sense eventually. Those of you who have mastered EFIS98 will have a good head start.

The PFD features include a speed trend vector, selectable Flight Path Vector (alternative Flight Director, usually used for visual or non-precision approaches), fully working FMA (Flight Mode Annunciator, the all-important text display above the horizon which lets you know what the plane is doing), and speed tape with minimum and maximum speeds correctly marked according to flap configuration.

The program replaces the Airbus thrust lever detents with keyboard inputs. This is a little disappointing, as advancing the thrust levers for take-off is surely one of the pleasures of a flight, and keyboard taps just aren't the same.

For my first flight I positioned to Heathrow for a familiar DVR4G off 27L. The system setup was very realistic, working through the FMGC pages in the order INIT A, F-PLN, RAD NAV, SEC F-PLN (not modelled), INIT B, PERF, PROG. Engine start was too rapid (APU start was very realistic) and the sounds a bit disappointing (more of this later). Take-off roll with FLEX power used about the right amount of runway and the rotation at VR had the right feel (there's no Force Feedback in the real Airbus!). Unfortunately the ND had 'gaps' between some of the waypoints on the departure SID but the aircraft seemed to know where to go in spite of this.

The autopilot was excellent throughout, giving good bank angles (usually 30 degrees) and excellent altitude capture with correct FMA read outs (e.g. SPEED, ALT). There was no 'nodding' in pitch, as some FS aircraft are prone to do, and the Autothrust held speeds well, apparently anticipating required power at level-off. Even on a single engine, the autopilot performed like the real thing.

Now for the manual flying... With the autopilot out you can elect to leave the Autothrust in and I suggest you do initially as it 'unloads' the pilot considerably.

As the AP comes out, the aircraft should maintain straight and level flight without stick input, and this is what the Just Flight 320 does. A roll to 30 degrees produced no nose drop, and when the stick was released the aircraft maintains that bank angle. A roll to beyond 33 degrees requires some back stick to keep the nose up, and if the stick is released the aircraft will roll back to 33 degrees; this all works well. In the real A320 there should never be a need to trim (if all systems are working correctly), and this was mostly emulated well by the software, but I occasionally found a heavy nose-down push was required, especially while circuit bashing.

About the author

Vince currently flies A320s and A321s for the BA-franchised British Mediterranean out of Heathrow. He started out hang-gliding before obtaining his PPL, and has flown a wide variety of aircraft as well as being a microlight 'test pilot' during the CAA regulation of the sport. He obtained his ATPL in 1996, and his first job was flying Shorts 360s and 330s on the night mail service from Exeter.

The flight model is accurate except for a fairly high drag. The real aircraft (in open descent mode) will wallow for 10-15 seconds before the speed decays and the AP puts the nose down to give approximately 1,000ft./min. down, but the simulated version went for the lower altitude rather sharply with around twice the descent rate. Unfortunately, tweaking the drag in the FS editor may have repercussions in the climb and fuel flow, which seem very accurate.

The A320 is a very good glider, and the whole approach procedure went 'by the book' with good LOC & G/S capture followed by uneventful autoland. Once again, there were 'gaps' in the arrival STAR.

As mentioned earlier, some sounds are a little disappointing, with the exception of GPWS. The visuals for the TCAS are excellent, but there's no "traffic traffic" shout associated with a threat. Likewise, the chime familiar to Airbus pilots that warns of an abnormal condition was absent.

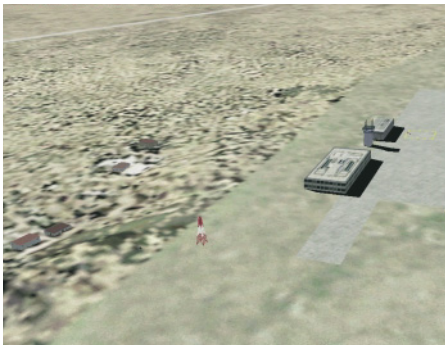
Fiddling with the overhead panel generally produced accurate displays on the systems pages. Turning off all the hydraulics (God forbid!) showed decaying pressures on the HYD page but, unlike the real 320, the plane continued to fly normally.

Just Flight have achieved a more accurate simulation of the A320 than I ever expected to see on a PC, and my niggles with the program are very minor. It will require some study and book work. But then again, so does the real thing! ■

Vince Hogg

World Airports

I left my heart in Bari Palese



Bari Palese – you can probably tell which is the default airport!

World Airports contains some excellent static and dynamic scenery, but the nine airports provided in the package seem to have been chosen arbitrarily from among some of the world's busiest air terminals, and the majority are in the USA. You'll find vast improvements to Manchester, Atlanta, Dallas Fort Worth, Newark, Los Angeles, Orlando, Philadelphia, Bari Palese, and Rome Fiumicino. An odd selection, but a look at the default versions will serve to remind you of how desperately they all required a facelift.

The quality of the enhancements remains good throughout. Each landing field has its full share of trackways, complex gates for heavies, 747s trundling around, and piles of crates and cargo everywhere; the concrete aprons have all the obligatory oil stains that we taxiway junkies crave. Each airport is a considerable improvement on the MS defaults; runway areas and terminals are as detailed as any we have seen.

The package includes a printed manual with flight plans for flying between the airports, airports maps and approach charts, plus all the features we've come to expect: accurate runways, taxiways, buildings and objects, all with highly detailed texturing, full night lighting and seasonal effects. There are numerous static aircraft and static and dynamic vehicles such as cars, buses, and service vehicles, and active jetways at each gate which dock exactly to your aircraft's front passenger exit. We were able to test the package on a 2Ghz machine with 512Mb RAM, and this kind of power certainly helps a great deal if you want the full benefit from these dynamic scenery elements.

Follow him? Or you can drive it yourself

If you're flying overhead at Philadelphia, for example, and descend to 1,000 feet, you'll notice around a dozen vehicles moving about the aprons at high speed; they even keep moving while you are in slew mode, which was a little surprising. This does bring a genuinely lifelike feeling to the experience, and is an exciting taste of the sort of thing we can one day expect to see as standard.

Be careful when taxiing into your hard standing or gate, because the small trucks will cross your path in quite death-defying forays, providing your computer will work with all sliders to the right. We were pleased to find a little yellow Mercedes airport van which you can drive, so you can give yourself heart failure by dodging under Rolls Royce turbines as you explore the airport.

Where is Bari Palese, we wondered. Well, it's on the Adriatic coast of Italy; we have a shrewd suspicion that one of the SimFlyers Associates may live there! The screenshots show very clearly the quality and style of the improvements which have been made to the default scenery. Several container vessels have been added to the nearby port, and a cruise ship waits offshore. An old tarmac runway in the default scenery has been removed and replaced with a wide grassy airfield near the coast.

At Fort Worth and Los Angeles there are extra files for the static scenery, which can be switched on or off at will using the Scenery Library menu; this is a sensible idea for reducing the load on lower-spec machines. If the included airports aren't on your regular flight schedules, it's unlikely that you'll be interested in this package, but if your local airport is featured, or if you're a regular visitor, you'll be glad to see the improvements. ■

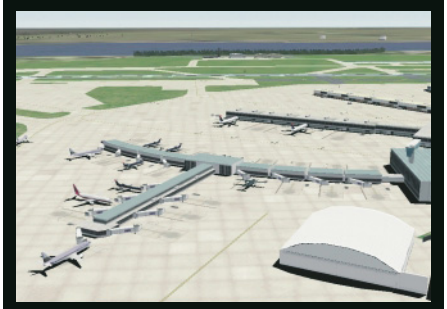
Christopher Jarman

A strange selection, but a great improvement!

Rome

Manchester

Dallas Fort Worth



Philadelphia

Review Score

Publisher: Just Flight

Price: £24.99

Website: www.justflight.com

Developer: SimFlyers Associated

At a glance: Excellent scenery without a doubt, but an eccentric selection of airports.

System Requirements: PIII 600MHz, 128Mb RAM, 16Mb graphics card, 195Mb hard drive space

Recommended: PIII 1Ghz+, 256Mb RAM, 32Mb graphics card

Boeing B314 – The Clipper

Cruising in comfort – 1930s-style

There have been many milestones in modern commercial aviation, usually punctuated by the commissioning of a new aircraft design that manages to extend the currently accepted boundaries. In modern terms this would naturally have to be the development of Concorde, a landmark that has yet to be surpassed, but if we look back to the 1930s, it was the launch of Boeing's Model 314 that was to forever change passengers' perceptions of air travel…

Named after the tall-masted ocean-going tea clippers that were once the fastest method of crossing the Atlantic, the Clipper was a plane capable of crossing this vast expanse of water in under 30 hours, while providing its passengers with a greater degree of comfort and safety than had previously been imaginable. Legroom wasn't an issue, with only 74 seats on board. The plush accommodation and silver service catering for which it became famous are unlikely to be seen again in modern commercial aircraft, let alone the dressing rooms and bridal suite.

In its time the B-314 was the largest aircraft in existence, and the first commercial aircraft to fly around the world. It also had the distinction of being the first airliner to carry an American president, when Theodore Roosevelt flew in one to the Casablanca conference in 1943. Sadly, it's been 50 years since anyone has seen one of these enormous flying boats struggling to get airborne, like some giant metallic Gooney bird, so this rendition from the Pilot's team, led by Stefan Schaefer, is rather more than just another add-on; it allows you to experience the Clipper's individual flight characteristics, combined with the authentic sights and sounds of what was a truly unique aircraft.

Although the package is based around one aircraft, Boeing actually constructed a number of different variants during a period of ongoing development. The Pilot's team have modelled the three prototypes, with their different tail fin arrangements, together with aircraft bearing nine other liveries. These include the original California Clipper that completed the first round-the-world flight, and the camouflaged BOAC Berwick aircraft that was famous for being piloted (for 20 minutes, anyway) by Winston Churchill.

The gmax modelling of these aircraft is of the usual very high standard we've come to expect from the Pilot's team, and is complete with all the usual embellishments – opening doors, 3D interiors, and full night lighting. Modelling quality is particularly noticeable where the wings and engine nacelles are moulded into the fuselage and genuinely look as though they belong there, rather than some models we've seen that

The Road to Bali by Boeing, not Bing and Bob!

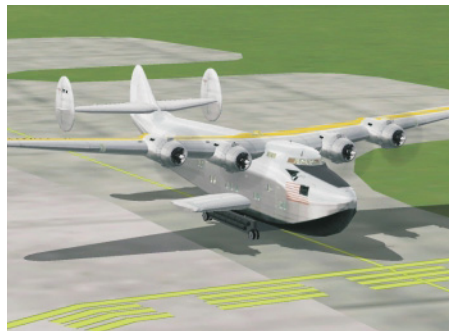
"It was impossible to grasp how mere engines could make it fly" (Night Over Water)

A closer look at those textures

"Behind each of the two engines was a mechanic's station with room for a man to stand upright, just about". (Night Over Water)

appear to be a collection of bits suspended in mid-air. The propellers and other ancillary objects are also nicely detailed, and the windows are not simply holes cut into the fuselage but have a real depth to them.

If you have a peep inside you'll see rows of passenger seats, together with a chart table and engineer's station to the rear of the cockpit. The only improvement you could possibly make to the internal visuals would be to use backdrops derived from digital photography, similar to those found in DreamFleet or Phoenix aircraft, but the absence of any actual aircraft left to photograph means this isn't an option. The highly reflective external textures are superb, showing every panel and rivet, which the screenshots hardly do justice to.



We can do runways too!

When you enter the cockpit you could be forgiven for thinking that the panels in these aircraft are somewhat spartan, to the point of being almost Heath Robinson-esque in design. That is, until you see the old black and white photographs of the real thing, which are… exactly the same. The flat grey plated bulkhead, in fact, looks more like the cockpit of a WWI tank than an innovative ocean-going cruise airliner. Rest assured, though; this antiquated appearance does not detract from the functionality of the instrumentation; it all works superbly, but if you want to get the best from your purchase you'll need to spend a little time with the manual, so you can get to grips with some of the less familiar controls.

A case in point here is the engineer's panel, which provides the perfect excuse for setting up a dual-monitor system; flying an aircraft of this size while fiddling about with the propeller pitch, or equalising the manifold

Inside the cockpit

"The flight deck was twenty-one feet long and nine feet wide, with full headroom throughout. Carpeted, soundproofed, and decorated with soft green wall fabric and brown leather seats, it was the most unbelievably luxurious flight deck ever made." (Night Over Water)

The pilot's forward view

Authentic radio panel

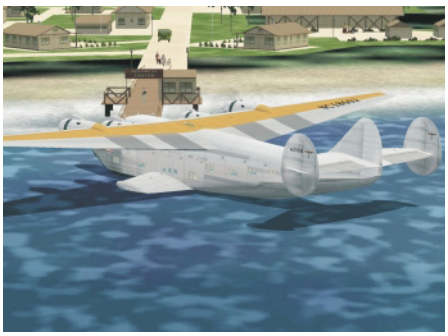
Looking into the rear cockpit stations

The flight engineer's and radio operator's desks

A large coffee for the radio operator

The flight engineer's panel

The Clipper goes to war



We can't wait much longer for those passengers

Heading out to sea

pressures, is not recommended, although it does give you the opportunity of getting your other half involved… "That's it, dear; you sit there and monitor those gauges!"

With no Clippers left from which to research the sound of the engines, B-29 engine sounds have been used, as the nearest approximation of the real thing.

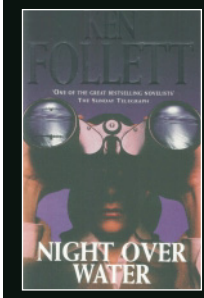
Because Microsoft has provided few destinations that cater for seaplanes, the developers of the B-314 package commissioned several new scenery areas based on airports used by the original aircraft. These range from the sunny Hawaiian islands to the Supermarine factory in Southampton on England's south coast; in each case you are placed on the water ready to receive your passengers for the trip ahead.

We found the flight model to be accurate, in that it's bang on the published numbers, although the performance is quite surprising for such a huge aircraft. With a standard cruise speed of 130 knots at 8,000 feet, and a take-off procedure that has you deploying flaps at 50 knots to break the treacle-like hold of the water, it's certainly a whole lot different to the way most of us were taught to fly.

The PDF manual included with the package is over 60 pages long and produced in a 1930s style, looking for all the world as though it was typed on one of those enormous sit-up-and-beg iron typewriters. The first 15 pages contain a fascinating potted history of the Clipper, tracing its development and inaugural flights through to the years of regular passenger service, until 1952, when the last aircraft was scrapped in San Diego. This is followed by a detailed explanation of all the controls, including the essential engine management procedures carried out by the flight engineer. If you think that being an accomplished 747 pilot means that you can manage without the manual, then think again; without setting up the Clipper correctly and following the take-off procedures, it's unlikely that you'll ever get this aircraft off the water.

If you're one of those people who simply refuse to read manuals, then the last chapter is the absolute minimum you can manage with, because it contains the operating limits and recommended procedures for each phase of flight. Also included are a couple of authentic-looking Pan Am charts detailing the scenery areas and their docking facilities.

Night Over Water (Ken Follett)



"Flying the Clipper was like living in a movie. The décor was opulent, the people were elegant, the two stewards were quietly efficient, everything happened on cue as if it were scripted, and there were famous faces everywhere."

Almost all the action in Ken Follett's 1991 novel takes place during one overnight journey aboard the Clipper, shortly after England's declaration of war in 1939, and provides an excellent glimpse into the functioning of the aircraft itself and the luxurious passenger facilities. With a cast of characters including a jewel thief, a Fascist member of the nobility and his rebellious children, a film actress, a brother and sister fighting for control of their family business, gangsters, FBI agents, a wealthy Zionist, a wife fleeing her husband, a flight engineer forced to betray the crew, and a nuclear physicist, you can safely expect a first-class thriller. At over six hundred pages, it should be long enough to keep you engrossed both ways over the Atlantic, even if you're flying in rather less magnificent surroundings.

A patch and technical support is available on the website, and Pilot's look set to build on the original software release; they have recently released the first in a free series of historic Flight Logs, created with the help of Clipper veterans, which not only includes PDFs but plenty of historical background as well.

The Clipper is an excellent rendition of an unusual and magnificent aircraft, the like of which we're sadly unlikely to encounter ever again. We should therefore be grateful to Pilot's for giving us the opportunity to take the controls and experience the opulence of this fine simulated version. The download version is 52Mb, but we'd recommend the boxed CD version which includes a video of the real thing – well worth seeing. ■

Joe Lavery

Review Score

Publisher: Pilot's

Price: $34.90 (£23.00 approx.) for the CD, or €39.99 (£26.00 approx.) for the download

Website: www.b314clipper.com

Developers: Stefan Schaefer and Pilot's

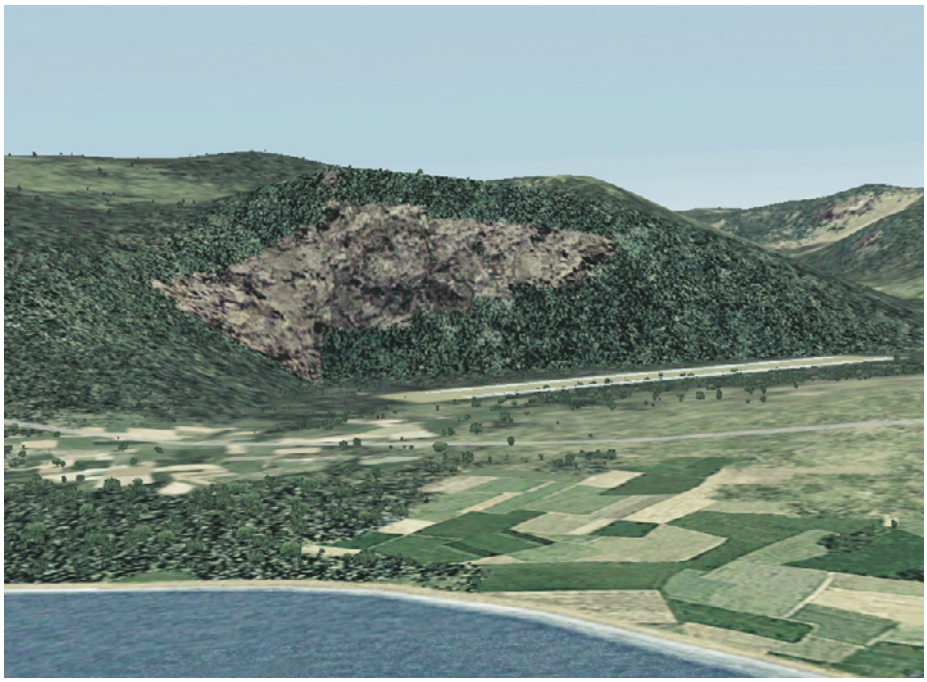
At a glance: Fly a genuine aviation legend from the 1930s – a substantial add-on which hopefully has a long future ahead of it.

System Requirements: FS2002 only specified

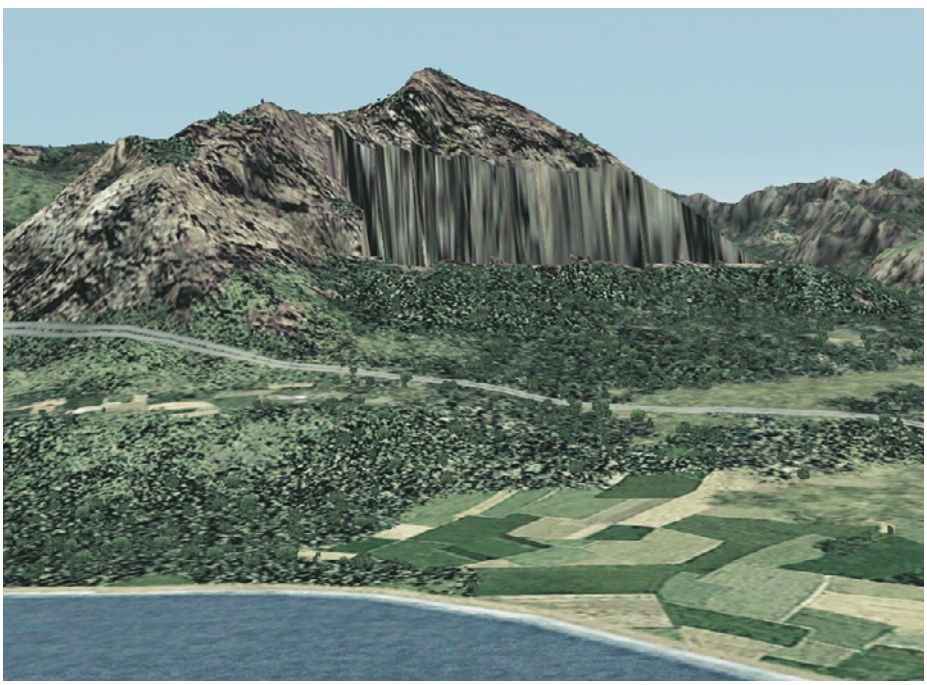
Recommended: P4 or Athlon 1.5Ghz, 256Mb RAM, GeForce3 or 4 graphics card

TerraMesh Europa 2002

A united Europe at last?



FS2002 Buochs airfield under the Rigi



TerraMesh Rigi looks great, but where's the airfield?

Forget cuckoo clocks and alpenhorns; Switzerland is a country containing some serious mountains. If you have ever been stranded on Dartmoor or even stuck halfway up Snowdon and been a little frightened, try flying a Cessna or a Piper Cub across some of the lesser-known escarpments in the home of the Red Cross and you'll know what anxiety really means.

The views from the highest parts of Switzerland usually extend only as far as your own feet, and then into nothingness as the mist and clouds swirl in, so the opportunity to fly around the Alps in perfect weather from the safe haven of our armchairs was too tempting to pass up, and we gratefully downloaded Lago's latest terrain mesh scenery for FS2002. With broadband ADSL the 70Mb file took 18 minutes to download, so be prepared to stay online for an eternity if you are limited to a 56k modem. Also, as the Lago site warns, unless you have bought the password/key to open the file, don't even think about it, as you will be wasting your time. The keys are very reasonably priced, however, at €5 each (approx. £3.20) per region.

At the time of writing, Lago have their first three areas of mesh scenery available – Switzerland (70Mb), Northern Italy (70Mb) and Southern Italy (67Mb). Lago's plan is eventually to cover the whole of Europe, offering eight areas this summer, and most of these will be available by the time you're reading this. The list, in order of release, is Switzerland, Northern Italy, Southern Italy, Austria West, Austria East, Germany South, France East, Spain and Portugal.

In case you are wondering why countries are being released in this sequence, the simple answer is that terrain mesh is most impressive where the mountains are highest, and so Holland would not have been a good place to start. The UK is on the list for the next batch of releases.

So, what is it like to zoom over the Alps in this latest offering? Well, take a look at Mont Blanc for a start. The default shows a sort of

The new Vesuvius haunts Pompeii

round lump, while Lago's mesh gives a frighteningly sharp-pointed mountain. Plotting a course across Switzerland can now turn your bloodstream into a glacier as those peaks rear up, and with full weather precipitation turned on and the thunder echoing in the hills, it's well worth the small sum that Lago are charging.

The north face of the Eiger in a Spitfire becomes a thrill. The odd airfield, such as Buochs, has now disappeared under the Rigi mountain, but that's the fault of the inaccurate default position of the field, according to Lago, and who can argue? The improvement is obvious, and the challenge of taking off from a runway embedded in a canyon is truly exciting as well as eccentric.

Taking off from Meiringen and steering west for a couple of minutes, we thought we might see the Reichenbach Falls where Holmes and Moriarty fell to their deaths; we couldn't find the falls, of course, because this is just terrain mesh, but the experience was still awesome. Perhaps Lago's next upgrade will deliver dynamic scenery as well?

But what about Italy? It seemed appropriate to take the Cessna Caravan Amphibian down to Bellagio and land outside a hotel recently visited on holiday; landing on lakes is delightful in any event, but landing on the typically Italian Lake Como is perfect.

Further south to Naples, and it's clear that the new scenery has improved the profile of that old villain Vesuvius. Additionally, the Amalfi coast is now considerably more rugged than the default scenery. Here, however, is where we must warn readers about expectations of terrain mesh; you can expect greater accuracy in the heights and shapes of hills and valleys, but you can't necessarily expect more accurate views of your favourite beauty spots or coastlines. At €5 per scenery area, however, we hardly think you can complain; it's as cheap as chips, and 98% accurate – we believe Lago has come up with a winning formula which is pleasingly kind to our pockets. It's those Italians – they charm us every time! ■

Christopher Jarman

The bigger the mountain...

Mt. Blanc – the default pimple

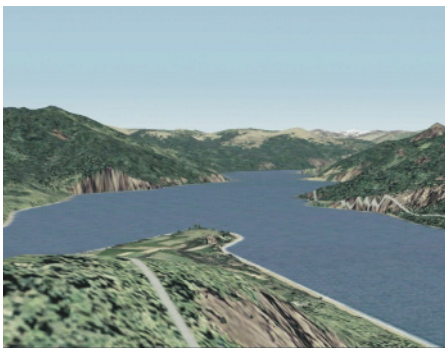
FS2002 Eiger mountain. Where's the mountain?

...the better the mesh

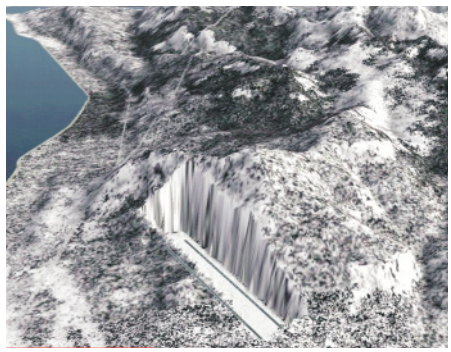
Rather more majestic in TerraMesh

Spitfire pilot is more likely to recognise the TerraMesh version

Perfect VFR weather over the Alps



Lake Como from 2,700ft looking North



Buochs in winter – Get out of that in a hurry!

Review Score

Publisher: Lago

Price: €5 (£3.20 approx.) per area

Website: www.lagoonline.com

Developer: Thierry Pignot

At a glance: Excellent quality and low prices for an ongoing series.

System Requirements: PIII 750MHz, 256Mb RAM, 32Mb 3D graphics card

Recommended: P4 or Athlon 1.5GHz, 512Mb RAM, 64Mb 3D graphics card

Welcome aboard; now it's time to go to work

In the right hands the MiG-17 is a fearful opponent

Today's special is snake and nape

Vietnam Air War

The Vietnam conflict is still a contentious period of American history, but there continues to be a stream of books and films on the subject. It is perhaps surprising, therefore, that there have been few PC games, let alone flight simulations, that depict this particular juncture in military history. Vietnam saw the birth of modern helicopter warfare as we know it, with gunships and air-mobile infantry transforming the way battles are fought.

While conventional aerial warfare was waged in the form of strategic bombing with B-52s in Operation Linebacker I and II, the role of tactical support aircraft should not be underestimated. In South-East Asia it soon became clear that the soldier's most lethal weapon was the radio, providing him with the ability to call in devastating artillery and close air support at a moment's notice. To enable this, there was a fierce battle for air superiority above the jungle, and it is this, along with key interdiction missions, that are the focus of Vietnam Air War.

Vietnam Air War has been developed both for Flight Simulator 2002 and Combat Flight Simulator 2, with the latter providing some

The MiG-21 cockpit – exquisite

Note the engine intake detail in the nose

The A-4C Skyhawk – small but deadly

The AC-119G Shadow strikes fear into the heart of the enemy

Unarmed and dangerous – the Birddog out on another mission

Superb detailing, even inside the Crusader's engine

palm-sweating action that is not for the faint-hearted. In launching CFS2 from the special add-on icon, you are immediately transported to South-East Asia via all-new menu graphics, customised mission briefings, and even post-mission medal awards. You have the option of flying 30 varied missions for the US Navy, US Air Force and North Vietnamese Air Force, either singly or strung together into three campaigns based on real-life combat sorties. These span the entire conflict, from the first dogfights between F-4 Phantoms and MiG-17s over the Gulf of Tonkin in 1965, to going straight into downtown Hanoi. There is new terrain covering the South-East Asia mission areas, including ten US and North Vietnamese airbases for CFS2, but only three in FS2002.

In order to cover this array of missions, Just Flight has included ten flyable US aircraft and three North Vietnamese fighters. On the fast jet front for the USAF and USN are well turned out models of the F-4E and F-4N Phantom IIs in both air combat and ground attack roles. As with all of the aircraft here, the exterior features of these fighters include authentic squadron markings, excellent aircraft geometries and all-moving parts. The AIM-9 Sidewinder and AIM-7 Sparrow missiles look authentic hanging off the wings, although CFS2 only models these as unguided rockets.

For more specialised ground attack, the A-6A Intruder, F-8E Crusader and diminutive A-4C Skyhawk are also included, and all are externally modelled to the same high standard. In CFS2 the tail hooks can be dropped on the USN aircraft so you can try and catch a three-wire when returning home to the nicely detailed USS Enterprise. The North Vietnamese Air Force sports two MiG-17 variants and the ubiquitous MiG-21 to keep the Western adversaries at bay. These have excellent reflective metal textures that also show off exquisite detailing along the external surfaces.

In action all of these jets behave fairly spectacularly, from hitting [SHIFT]-[F10] to kick in the afterburner off the carrier deck, to twisting and turning over the jungle in a guns-only dogfight. The MiGs are agile enough to give the meatier Phantoms a good run for their money up close, so the lack of guided missiles is not a major factor.

Dropping freefall ordnance takes a lot of practice, particularly as the weapons loadouts are accurate, and so give you only one or two chances to hit your primary objective.

Inside the cockpits the panels are recreated accurately, with the MiG-21 and F-8 standing out from the rest in terms of sheer attention to detail. The virtual cockpits, essential for using the padlock view during dogfights, are of more variable quality, though. While some of the virtual cockpit panels look good, the surrounding cockpit frameworks can look downright spartan; come dusk, there is no cockpit lighting in normal or virtual cockpit views, making night missions extremely tricky to fly.

In addition to the fast jets there are several other interesting machines to fly. The venerable Douglas A-1H and A-1J Skyraider that served in Korea are also available here to pack a hefty punch against hard and soft ground targets. At the bigger end of the scale is the ominous AC-119G Shadow gunship, carrying four Gatling mini-guns that unload at a staggering 4,000 rounds per minute. The most innocuous-looking aircraft is without doubt the humble Cessna O-1F Birddog, whose only armament is four smoke rockets. The pilots of these little guys were some of the bravest around, as they had to beat the Viet Cong to downed American pilots in order to mark the position with smoke so that the Hueys could come to the rescue. And you guessed it – the legendary Huey is also included so that you can not only fly the Cessna to find your stranded buddies, but also fly the rescue missions too.

Some of the aircraft here are available to download direct from Alpha Simulations website (www.alphasim.co.uk) at between $5 - $9 each(£3.00-£6.00 approx.), but Vietnam Air War, at £24.99, offers better value for those wanting an all-round package for both FS2002 and CFS2, including as it does 30 missions, a mission editor and a 60-page historical manual to boot. Those wanting a dedicated sim will have to wait until Third Wire Productions' Strike Fighters: Project 1 is catapulted from the flight deck, but for now Vietnam Air War is definitely our best buy. ■

Kenji Takeda

The rotary club

If there's one aviation icon to come out of the Vietnam war, it is the Huey – or, to give it its full name, the Bell UH-1C Iroquois. This jack-of-all-trades was gunship, troop carrier, air ambulance and whatever else was demanded of it. You may be surprised to see it in CFS2 but it flies just as well, or badly, as in FS2002. With a little bit of practice it is actually very manageable, and makes for some great missions in Vietnam Air War that are truly challenging. So slap on that Wagner CD and crank up the volume for some real seat-of-the-pants chopper action.

The Bell UH-1C Iroquois Huey - icon of the Vietnam War

Heading home to heal the wounded

Review Score

Publisher: Just Flight

Price: £24.99

Website: www.justflight.com

Developer: Various

At a glance: A high-quality and well-rounded package,covering the major aircraft and historical missions from the Vietnam era. Good value.

System Requirements: PII 450MHz, 64Mb RAM, 16Mb 3D graphics card

Recommended: PIII 500MHz, 128Mb RAM, 32Mb 3D graphics card

Scenery Greece & Balearic Islands

Sun, sea and simulation!

If you travel abroad for your holidays, as most of us do these days, then it's highly likely that you will have visited the Balearics or the islands around Greece; these have long been favourite holiday destinations, particularly for UK residents. If you haven't, then these two scenery packages from Aerosoft will give you an insight into what you're missing, and will also provide you with the opportunity of piloting your own holiday jet on a typical package tour to these destinations.

Once you arrive, however, it would be better if you rented a single or twin-engined light aircraft (simulated, of course!) in which to do some sightseeing; the authors have modelled many of the major landmarks for you to explore, and flashing past them at 350 knots in a jetliner is not the most practical way to savour the moment.

In case you're unfamiliar with them, the Balearics consist in the main of four islands situated in the Mediterranean off the coast of Spain, Majorca being the largest, followed by Minorca, Ibiza and Formentera. Majorca's capital, Palma, is not far from the airport, on the south coast alongside the resorts of Palma Nova and Magaluf. The

Palma's famous cathedral

The birthplace of civilisation (Athens, not Acton)

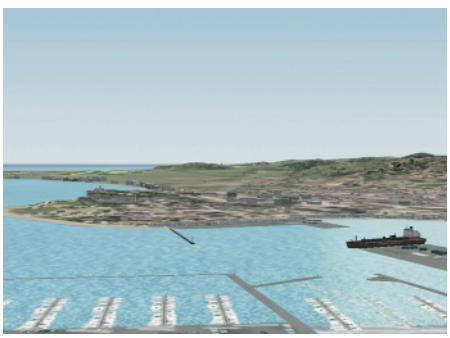
authors of Balearic Islands have done a fine job of modelling the airport, with working gates and dynamic scenery objects, but it's the city of Palma itself and its famous cathedral that are the most impressive, and well worth that leisurely fly-by. The other islands are served by smaller airports and, with only a short distance separating them, are ideal for a bit of island hopping.

The area covered by Scenery Greece is immense. It was created using high-resolution satellite data from GEOSYS Data, France, which gives the islands a far greater degree of realism than the standard FS2002 scenery. The rather angular default shapes give way to flowing curves and craggy rocks set in a turquoise sea. The desolate airports dotted around the mainland and numerous popular holiday islands are brought to life with custom buildings and AI traffic.

Obviously, this is more evident at the larger airports such as those on the islands of Rhodes and Thessaloniki, and also at Athens on the mainland. Once again, exploration is far more rewarding using a relatively sedate form of transport; otherwise you'll miss the Acropolis and all those historic monuments for which Greece is famous.

Both packages include airport schematics and approach charts, although these are printed in the diminutive manuals, and are so small as to be almost unusable. Adobe PDF files provided on the CD would have been more useful, so that you could print them out yourself, but nevertheless the scenery itself is well developed and far superior to Microsoft's original efforts. ■

Joe Lavery



Across the harbour to the airport at Ibiza

Review Score

Publisher: Aerosoft

Price: £24.99 Balearic Islands, £29.99 Scenery Greece

Website: www.aerosoft.com

Developer: Thorsten Loth & Manfred Spatz (Balearic Islands)

At a glance: Fantastic scenery, thin manuals. Typical scenery packages.

System Requirements: PIII 600MHz, 64Mb RAM

Recommended: P4 or Athlon 1GHz, 256Mb RAM, 64Mb 3D graphics card

We've got some great deals in the Balearics…

Majorca

Mahon

…or maybe you'd prefer the Greek islands?

Kefelonia

Rhodes

FSMaintenance

We have a situation here!

Although the vast majority of flight simulator users take their hobby very seriously, in our experience there are very few who consider the maintenance aspect. In real aviation this is a primary consideration that must be attended to with the utmost vigilance, because not to do so would be courting disaster. If you like to do things by the book, it's worth examining the way you fly, and particularly the consideration you have for your aircraft. This is where Lago's latest release, FSMaintenance, fits in; it's designed to make you more aware of your aircraft's reliability, the importance of regular maintenance, and the financial implications involved for commercial fleets.

The program is a module that essentially monitors everything (and we do mean everything!) that you do while running the simulator, via a simulated black box. It doesn't simply check to see that you get from A to B on time; you need to be 'doing it right' from the time you enter the cockpit to the time you shut down the engines on arrival at your destination – everything you do has a certain bearing on the reliability of your aircraft.

If you taxi too fast, make high-G turns or heavy landings, or simply forget to set the correct QNH pressure settings, you're more likely to create a problem than if you do these things correctly. This is where the realism factor comes into FSMaintenance, because it slowly degrades the reliability of the aircraft within your fleet, using information derived from the monitoring systems combined with the normal wear and tear associated with every hour flown.

The idea is that you create a fleet manager and fly your aircraft in the normal way to whichever destinations you choose. This will earn you a variable amount of money, dependent on the duration of the flight and, of course, the size of the aircraft. You then use this money to put right any damage you might have caused (it will happen, we can assure you!), including the cost of any normal scheduled maintenance for your fleet. Don't forget that you should be making a profit as well! You'll be amazed at how badly you've been flying up until now and, if you manage a whole flight without a single warning beep, then you can consider yourself to be airline material.

If, on the other hand, you get it all wrong, you could potentially earn nothing for that particular flight, which means you won't have any money to pay for maintenance –

Colours change to reflect the status of the systems

a situation that could eventually lead to bankruptcy and the grounding of your fleet.

By regularly checking the System Status Display, you can monitor the condition of your aircraft's systems and see the reason for that last warning beep. There's no doubt that FSMaintenance dispels any preconceived ideas of pilot excellence you might have, although, to be fair, most of the warnings you get are for minor infringements of speed or altitude, or even for starting engines without switching on the beacon. The total failure of a complete system or 'system classes' (a logical collection of related systems) is fairly rare, and normally only occurs if you get it all badly wrong or totally ignore the repair and maintenance requisites identified by the system.

If you simply enjoy flying and don't think too much about the aircraft or your technique, then FSMaintenance is probably not for you. But if you like to do things by the book and enjoy the challenge of becoming a more technically competent pilot, then FSMaintenance will quickly identify your failings and certainly help you to correct them. ■

Joe Lavery

Review Score

Publisher: Lago

Price: €25 (download) (£16.00 approx.)

Website: www.lagoonline.com

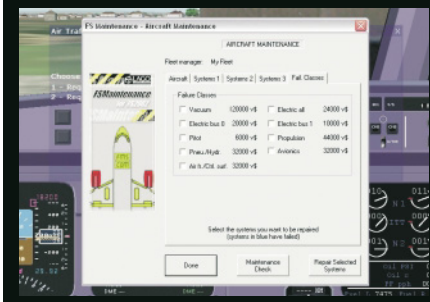
Developer: VistaMare Software

At a glance: Increases FS realism by raising awareness of regular maintenance and cost issues. Become a better pilot – learn to treat your aircraft with the care and respect that befits such a complex piece of machinery.

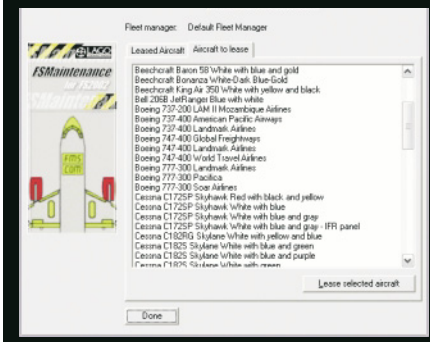
System Requirements: : PII 750MHz, 128Mb RAM, 32Mb 3D graphics card

Recommended: P4 or Athlon 1.5GHz, 256Mb RAM, GeForce3 or 4 graphics card

FSMaintenance display modes

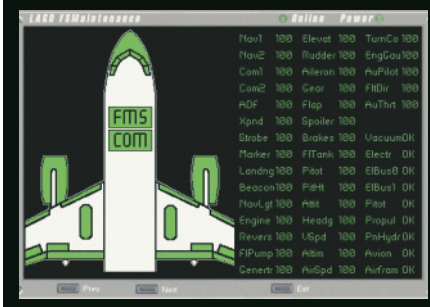


Aircraft Maintenance

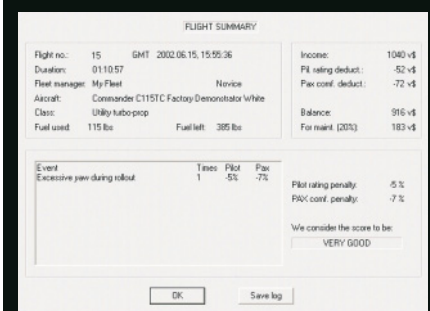


Aircraft Management

Fleet Manager



Status Display



Flight Summary

Mustang vs Fw190

American agility... ...takes on German armour

Just Flight's latest add-on for CFS2 and FS2002 focuses on two aircraft that played a key role during WWII, the P-51D Mustang and the Fw190 Butcherbird (did anyone ever call it this?) On the surface, the choice of aircraft from US developer Flight One is a strange one. Both planes are included in Combat Flight Simulator, while the mighty IL-2 Sturmovik includes a wonderful Fw190. In addition, both planes are extremely popular among freeware developers.

Installation was the usual painless affair, and it took only a few minutes to load the aircraft, but what on earth could a commercial add-on with a price close to that of a standalone sim possibly offer that others haven't already done before?

The Mustang looks just like a Mustang, while the Fw190 has the familiar looks of, well, an Fw190. Both planes sound just right too; the well tuned Mustang's engine burbles reassuringly at taxi, while the Fw190 has the typical 'bag of spanners' banging and clanking going on outside the canopy, characteristic of most German engines of the era (just ask any VW Beetle owner). Both aircraft are complete with moving canopies, working drop tanks and proper suspension – everything, in fact, that you'd expect to find on the real thing.

Mustang vs. Fw190 is not about wonderful innovations you've never seen before – it's about everything you've seen before, done

Silent Hunter wishing he'd stayed underwater

It'll fly noticeably better after you unload

One of the 18 new missions included

correctly. When you fire up this expansion, there are no great surprises, and nothing jumps out of the screen or speakers screaming "Wrong!" In fact, the more you look at the aircraft, the more they grow on you. Jump in the Fw190, for example, and take a good look at the instruments. Speed is measured in km/h, and altitude in km; the compass has an O where E would normally appear (Ost being German for East); roll back the 190's canopy and a small ladder extends behind the cockpit to allow the pilot access.

The treats continue during taxiing and take-off. Both planes are skittish on the ground while taxiing, requiring delicate pedal movements to line them up and keep them in position. On take-off the undercarriage retracts with a reassuring thump and, if you take a look outside, you'll see the heart-warming sight of the wheels not quite retracting at the same time or speed, just like the real thing.

The subtle splendour of the product really starts to shine through in flight; the two planes have distinct flight models that lend some individual personality to them both. The Mustang is nimble, fast and light, while the Fw190 feels slow and lumbering, but incredibly tough. Both aircraft are also satisfyingly nose-heavy, particularly the Fw190, making well ordered approaches an art form as you juggle the balance between approach speed and descent rate.

The real fun comes, of course, when you fly in CFS2, undoubtedly the package in which most buyers will want to use the planes. The Mustang excels in escorting other planes over vast distances, and defending them against seemingly insurmountable Luftwaffe forces over enemy territory. The Fw190, on the other hand, is slower, has heavier armour, and packs a stunning amount of firepower. The 18 new missions included are designed with these factors in mind, with Mustangs running cover and interception against hordes of marauding Fw190s attempting to shoot down the Allied bombers. The sky soon turns into a swirling mass of black smoke and trails as the two sides merge; on the highest realism setting, keeping the agile Mustang in the sky on the very edge of its flight envelope soon becomes an art form that you'll want to demonstrate to anyone prepared to watch.

The detail is on the devil!

Actually shooting down an Fw190 takes some doing, given its heavy armour and the relatively puny machine guns arming the Mustang. The greater speed of the Mustang also had us frantically yanking the stick to avoid collisions with errant Fw190s that seemingly stop dead in the sky.

For those with a penchant for grass cutting, there are also missions that focus on strafing and bombing, including a memorable Mustang rocket attack on two submarines. Fw190 devotees are equally well catered for, and essentially you fly the enemy side of the Mustang's missions. Focke-Wulf's legendary aircraft look fantastic as they leave their home field with piles of bombs slung under the wings and fuselage, and feel great as they lighten up when those bombs get dropped.

The look, sound, and flight characteristics of the aircraft here are impressive; the missions included for CFS2 are at once engrossing, challenging and great fun to fly, and the included scenery of Bodney and Abbeville airfields adds value to the package. From a pure simulation point of view, the planes themselves are a wonderful challenge to get to grips with in FS2002, and are sure to appeal to those out there who want to learn how to 'do it right'.

Uncle Sam wants me for a moonbeam!

A few more variants of each aircraft wouldn't have gone amiss, and the documentation that comes with the game is surprisingly lacking in detail (what are the take-off speeds, startup procedures and maximum landing weights of each aircraft?) These are minor gripes though, and Mustang vs Fw190 is well worth a look, even if you already own IL-2 or CFS. ■

Peter Wright

Tidy cockpits in both aircraft, with fully working gauges

Review Score

Publisher: Just Flight

Price: £19.99

Website: www.justflight.com

Developer: Flight One Software

At a glance: Does everything countless other sims do, but does it right. A worthy add-on for dedicated WWII simmers.

System Requirements: : PII 300Mhz, 64Mb RAM, 16Mb 3D graphics card

Recommended: PII 450Mhz, 128Mb RAM, 64Mb 3D graphics card

Greatest Airplanes Archer!

A real dream machine

The Piper Cherokee Archer II is a particular favourite of mine, because it's one of the aircraft I flew during my pilot training. Although the actual model was a PA-28 Piper Warrior, they are both derived from the same basic design. In fact I converted to another variant, the PA-28 Cherokee 160, some time after passing my finals, so reviewing the DreamFleet Archer from Flight One is like getting in touch with an old friend.

This is the first GA aircraft DreamFleet has released since the team decided to enter the commercial side of flight simulation. Their previous freeware work was mainly based around the Cessna range, and was always showered with accolades of excellence, which, it has to be said, were well deserved. Have they put the same level of dedication and attention to detail into this latest project?

The aircraft depicted in the Archer package is modelled on a real aircraft owned by Nels Anderson, the owner and webmaster of www.flightsim.com. It comes with the separate Text-o-Matic program that allows you to change liveries and call sign for one of the four alternatives provided. Incidentally, if you're one of the more artistic members of the flying fraternity, you can even create your own liveries using the blank textures on the CD.

A quick stroll around the aircraft soon dispels any thoughts that DreamFleet might have lowered their standards; the modelling is both highly detailed and accurate, showing all those little touches we like to see – features such as the small tie-down rings, fuel drain cocks and pitot tube under the wings, the moulded ribs along the floor pan, and the handle above the opening cockpit door. Even the engine cowling opens, making it more difficult to tell if you're looking at a model, or a photograph of the actual plane.

Climb into the cockpit for a moment and you'll get a good idea of what it's like to sit inside a real PA-28, because the panel and associated views are based on high-quality digital photographs of the original plane. The instrumentation is comprehensive, and the 3D virtual cockpit is one of the best we've seen.

A quick trundle down the runway shows that the flight model was developed by someone who knows all about the PA-28; it has a willingness to fly to the point of being quite slippery on landings and, like the real aircraft, will recover from a stall if you simply let go of the yoke. Another first class job from DreamFleet and Flight One. ■

Joe Lavery

Modelling and detail are excellent

One of the different liveries provided

Velour is bound to come back into fashion one day!

One of the best cockpits we've seen

Review Score

Publisher: Flight One

Price: $24.95 boxed version (£16.00 approx.) $19.95 download (£13.00 approx.)

Website: www.dreamfleet2000.com & www.flight1.com

Developer: DreamFleet

At a glance: Fly the DreamFleet Archer and you've almost been in the real one.

System Requirements: PII 350MHz, 64Mb RAM, 32Mb 3D graphics card

Recommended: P4 or Athlon 1.5GHz, 256Mb RAM, GeForce3 or 4 graphics card

Flight Sim Models Ultralights

We'll have to get a heater for this thing

Room for a friend (but not a big one)

You'll need to wrap up for this flight

Instrumentation is (authentically) rather sparse

Most flight simulator pilots cut their teeth on the default Cessna 172 before progressing to larger commercial aircraft and possibly even the heavy metal brigade; but pilots of those aircraft that most closely resemble the machines developed by the pioneers of flight, microlights, are rarely catered for.

A small company called Flight Sim Models, run by father and son team Lee and Kyle Prestwood, hopes to redress the balance with a range of ultralight and light sports aircraft that will take you back to the fundamentals of flying. (Ultralights, incidentally, are called microlights only in the UK, where the term 'ultralight' was already taken by the Popular Flying Association as a category for home-built aircraft.)

They have initially released four aircraft packs – the Aero-Works Aerolite 103 Ultralight, the M-Squared Breeze 2 Series, M-Squared Sprint/Sport 1000 Series and the Flightstar II SL/SC Series. Each aircraft pack comes with anything from three to six variants covering the landing configurations currently available. You might have, for example an aircraft with wheels, one with skids and another with floats; in addition there may also be dual-seat versions provided.

The 3D modelling is courtesy of FSDS Pro and is not overly complicated, which is really the nature of ultralights anyway. This also makes them ideally suited to any PC system, because the demands made on the hardware are fairly minimal. That's not to say that they're low on quality, because they're not; the modelling is nicely done, and includes animated control surfaces and 3D virtual cockpits. In fact the authors have worked hard to make the models reasonably detailed, while making sure that the performance is no worse than the FS default aircraft, so those all-important frame rates are virtually unaffected. We managed to get over 24fps at the highly detailed Palma airport reviewed elsewhere in this issue.

If you've never flown an ultralight before, then you have a real treat in store, because they are the most gentle and forgiving aircraft you can imagine. You'll find that they respond instantly to the controls, although they have relatively low performance. They're just about perfect for the novice flight simmer, and with a cruise speed of between 35–65 mph you have to work quite hard to stall them. The cockpits are a minimalist's dream but again this is not a criticism of the modelling; a quick visit to the real aircrafts' websites shows that they are accurately designed. All in all, a competent job from a relatively new design team, who have a few more models in the pipeline. We look forward to seeing them. ■

Joe Lavery

Nicely detailed airframes on all models

The various flight configurations available for the Aerolight 103

Review Score

Publisher: Flight Sim Models

Price: (per pack)

Aerolight 103 $9.95 (£6.50 approx.)

M-Squared Sport 1000 & Breeze 2 $14.95 (£10.00 approx.)

Flightstar II SL/SC $12.95 (£8.50 approx.)

Website: www.store.yahoo.com/flightsimmodels/index.html

Developer: Flight Sim Models

At a glance: Get back to seat-of-the-pants no-frills flying basics.

System Requirements: : PII 350MHz, 64Mb RAM, 32Mb 3D graphics card

Recommended: P4 or Athlon 1.5GHz, 256Mb RAM, GeForce3 or 4 graphics card

Flying on limited panel

With visibility almost nil, you need to be prepared for instrument failure

IFR flying without the most important instruments

Instrument flying can be tricky at the best of times, but when things go wrong the difficulty increases dramatically; without any external visual reference as a guide, the plane can be significantly out of shape before you realise that a problem exists. If the root cause of the upset is an instrument failure, working out what's happening will take up more valuable time and, to make it even worse, that lack of visual reference makes recovery much harder…

Instruments are generally so reliable that many pilots will fly for years without experiencing a significant instrument failure. Some instruments have flags to indicate that they have failed, but many will just stop functioning properly, which means you can never be certain that the flag will appear when the instrument does give up the ghost. A possible scenario is that, as you are flying merrily along, the plane may seem a little sluggish in picking up the slightly dropping right wing, and you assume that this is caused as usual by a slight gust or updraft. As an experienced pilot, you subconsciously add a little more left stick to pick up the wing, and there's no sense of alarm because the wing has only dropped five or ten degrees. The next thing you know is that your speed is rapidly increasing to your maximum (VNE), and you crash. You may find this hard to believe, but it has happened to the odd commercial jet when there have been glitches with the artificial horizon instrument.

Level turns on limited panel – monitor your turn, sip and altimeter

Flying without the full complement of instruments is known as 'limited panel' or 'partial panel' flying. The training for, and examination of, limited panel flying concentrates on flying without the two key instruments, which are the AI (Attitude Indicator) and the DI (Direction Indicator). These are also known as the artificial horizon and the gyro compass, and are critical to safe flying. Limited panel flying is a significant part of the training for either the IMC rating or the Instrument Rating in the UK, and mastering it can be one of the hardest parts of the course.

Limited panel flying can, however, be easily learnt, and the good news is that it can be solved by the divide and conquer technique. We can tackle loss of the AI and DI independently, even though they are likely to fail together because they are both vacuum-powered instruments. The AI is normally your primary instrument for controlling pitch and roll, whereas the DI is largely a navigation instrument. Loss of the DI is the easier to handle, so we'll consider that first. The two techniques you will need are 'timed turns' and 'compass turns'.

Turns without the direction indicator

When you make a turn on instruments, you should normally make a 'rate one' turn. This standard turn will change your heading at a rate of three degrees per second, which means that after two minutes you will end up pointing in the direction you started from. You should try this out on the full

panel. Start by flying north, straight and level; then start your timing (ideally with a stopwatch) and immediately roll into a turn with the turn co-ordinator's plane or indicator needle on the rate one graduation, which is usually the first tick on the dial. Hold this bank angle accurately and then, after exactly two minutes, roll the wings level. You should now be heading north again, within a cat's whisker.

This is a timed turn, and it can be used for heading changes other than complete circles. If you want to change heading by 120 degrees, 40 seconds will do the trick. Similarly, 80 degrees will take 27 seconds; the error caused by rounding up the one degree will not be noticeable. For small angles it is easier to count seconds (using "one elephant, two elephants…", or whichever trick you use for counting seconds). For a ten-degree heading change, simply start the turn, count to three and roll the wings level again. Timed turns won't leave you exactly on your intended heading, and you will need to make small adjustments once you are straight and level.

When the direction indicator has failed, you will still have the magnetic compass. This venerable instrument is still the only heading indication on some aircraft, but the ease of use of the DI has resulted in the magnetic compass normally being used only as a means of checking the DI for drift. For limited panel flying, however, it is a godsend.

The magnetic compass suffers two types of error. The first is associated with acceleration and deceleration, and consequently will not concern you in normal steady flight. The second is usually referred to as 'turning error', and it will most definitely affect you during limited panel flying. The compass will misread dramatically as you turn onto north or south; the effect is nil at the magnetic equator, and becomes greater as you approach the poles. In the UK the error is typically about 30 degrees, and hence is highly significant. There is no turning error when you are turning onto east or west, and the error increases progressively until it reaches a maximum when turning onto due north or south. Many complex methods have been devised to calculate how to compensate for this, but simplicity is likely to cause the least errors; the method given here may not be the most elegant solution, but it works well.

Undershoot north, overshoot south

The key to managing turning errors is to remember UNOS, which is an extremely useful acronym for Undershoot North, Overshoot South. (You would have to swap this around in the Southern Hemisphere.) In practical terms, what this means is that if you are turning onto north, you would stop the turn before the magnetic compass indicated north. In the UK, if you were in a rate one turn from west (270) onto north (360), you would 'undershoot' by 30 degrees and roll the wings level when your magnetic compass heading reached 330. Once straight and level, the compass will move to approximately north. In a similar fashion, turning from west to south (180), you would 'overshoot' and not roll out until the indication on the magnetic compass had passed south and reached 150. Again, the compass will correct itself once the plane is straight and level.

When you want to turn onto other headings, you should roughly proportion the undershoot or overshoot; turning onto 030, you would undershoot by 20 degrees. Any calculation more complex than this would be prone to error, especially as you will only be doing this when you are already under pressure.

Once you have completed your timed turn or your compass turn, your heading is unlikely to be accurate, so you will need to make a small adjustment. When most people look at the magnetic compass, it appears to work the wrong way round. If you were on heading 350, north would appear to the left on the magnetic compass, but if you wanted to turn onto north, you would have to turn right, which is away from the indication. The standard methods of dealing with this are to consciously turn the 'wrong' way, or to think of where the headings would be on a compass rose. One particularly neat solution is to use the bezel on the ADF (Automatic Direction Finder) instrument. It can be turned to your actual heading, and the direction of any turn can then be read from the bezel as if it were a DI.

A final option for making turns, if there is a handy NDB nearby, is to tune into this on your radio, and use the needle as a guide for turning. Unfortunately this does have a couple of significant disadvantages; as you fly over any significant distance, your movement and any drift will affect the ADF reading too, making it inaccurate, and you are also likely to need the ADF for navigation purposes.

Keeping things under control

Whilst the attitude indicator is probably the most important dial on your panel for instrument flying, unlike the Direction Indicator it has no direct substitute. Hugely expensive planes are likely to have multiple AIs, but more modest machinery does not. Consequently, information about the plane's attitude can only be inferred from the other instruments.

When a plane turns, this is shown on the turn co-ordinator. If the slip ball is in the centre too, the only way a plane can turn is by being banked. Thinking about this the other way round, if you keep the slip ball firmly in the middle, the turn co-ordinator shows whether you are banked or not. It will even tell you how much you are banked, as long as the angle is small. Taking a similar approach, you will realise that when the plane climbs, the altitude increases, the VSI (Vertical Speed Indicator) shows the rate of climb, and your speed reduces. Unfortunately, these indications do not change instantly when a plane enters a climb; if you pitch up the aircraft's nose, it takes time for the altitude to increase, just as long for the speed to change, and the VSI has significant lag anyway. Despite this, they are all that is available to help you.

Most important for level flight is, not surprisingly, the altimeter. For climbs and descents, the airspeed indicator becomes the primary instrument for controlling your pitch. While these instruments will let you determine what the aircraft is doing, what is

If you don't realise that the artificial horizon has failed and you keep using it… this is what happens

One moment everything is working properly...

...then all of a sudden the artificial horizon decides to give up

It's not too bad if you are properly trimmed. Don't forget that the DI works from the same vacuum system, so it has probably stopped working too

of the utmost importance in flying a plane on limited panel is smooth trimmed flight, and the knowledge that the aeroplane's handling is exactly the same whether you are flying visually or with the main instruments missing.

Going flying

Time to get some practice, and the Cessna 172 or 182 is ideal for learning these skills. Make sure that the magnetic compass is visible, and turn off the automatic balance if you have rudder pedals. You will need IMC (Instrument Meteorological Conditions) to practise limited panel flying properly. The quickest way to do this is to turn the visibility down to half a mile. Climb to about 4,000 feet above ground level and establish yourself in a steady, trimmed, level flight. Take your hands off the controls to make sure you are properly trimmed; do not put your hands back on the controls again.

Now for the big moment… Fail the attitude indicator and the direction indicator. Because you have the plane trimmed in level flight, the aircraft should continue to fly straight and level, at least for a short while. Your eyes should now scan between the altimeter and the turn and slip indicator, with less frequent glances at the magnetic compass to check your heading. You should check the VSI occasionally to see if this is moving towards climb or descent. When you are flying level, the VSI can often give an early indication of climb or descent, but it is useless for actually trying to control the plane because of the lag in the instrument. Also check the ASI, which should remain unchanged unless things get out of control.

Unless you have trimmed your aircraft incredibly well, and the air is as smooth as silk, sooner or later the plane will deviate from its straight and level course. Your task now is to guide the plane back again with repeated very small and extremely gentle, but positive, joystick movements. Think of yourself as occasionally giving the plane a few nudges to keep everything under control. As you will quickly find out, if the plane is not properly trimmed at all times, your task is very much harder.

The next thing to try is a turn. From your steady straight and level flight, smoothly roll the aircraft left until the turn indicator or co-ordinator shows a rate one turn, and keep the balance ball firmly in the middle with the rudder pedals. Continue to monitor between your turn and slip instrument and the altimeter. There may be a slight tendency to lose height, as there is in any turn, in which case you will need a very slight backwards pressure on the stick to hold your altitude. When you reach the end of your turn, gently roll the plane level again. Once you can safely turn the plane in both directions, you should try turning onto precise headings using either timed or magnetic compass turns

in the manner described above. Remember that the more accurately you can hold the rate one turn, the easier it will be to roll out onto your desired heading.

Changing altitude

When you are confident in level flight, you can move on to climbs and descents, which are both approached in a very similar fashion; what you do is exactly as you would for normal climbs and descents. So, go back to visual or full panel flying, and practise starting climbs, levelling off, initiating descents and levelling off again. Make your rate of climb and descent about 500 feet per minute at this stage, and pay particular attention to the movements you make with the joystick and the throttle.

Once you have these movements firmly imprinted in your mind, you are ready to try changing altitude on a limited panel. The climbing and descending technique relies on the inextricable relationship between speed, power and rate of climb or descent. If you control the first two of these, the other is guaranteed to follow. On limited panel you can easily and accurately control your power because you have operational engine instruments. Similarly, the ASI is working, so you can easily control your speed. Holding these two accurately will also hold your rate of climb or descent accurately, and thereby your pitch.

For a climb, you would start by adjusting the throttle lever to set climb power, which in a small aircraft is probably full throttle. Then pull the joystick slightly backwards to initiate the climb, which after a second or two is followed by moving the stick forwards again. Next, monitor the ASI and control your speed by slowly easing the joystick backwards or forwards, exactly as you would in a normal climb. The only thing that makes this harder is that you do not have any real or artificial reference (horizon) to guide you. As you gain experience, you can try climbing and descending at steeper gradients, but be careful – enthusiastic flying is generally not advisable when flying on a limited panel.

Levelling off is even simpler, as you are just returning to straight and level flight, which you have already mastered. Slowly ease the joystick forwards a little and hold it there until the altimeter stops increasing. Then adjust the position of the joystick to hold the altitude as the speed increases. Finally, reduce power to your cruise setting. The key to levelling out is to make a smooth transition from the climb to level flight. This in turn can only be achieved by starting the change well before you reach your new altitude. About a hundred feet will be adequate for a small plane; larger aircraft with stronger climbs will require more anticipation.

Your descent on limited panel should start with a small reduction in power, to exactly

Climbing on limited panel

Descending on limited panel

You have to be able to fly an approach on limited panel – you've got to land at some point!

Nose-low unusual attitude – it doesn't get much worse

the same setting as you used when testing descents visually. Depending on the aeroplane you are flying, this will either be sufficient or you will need to ease the stick forwards to initiate the descent. Once in the descent you should control your speed exactly as you did in the climb. If you are going too fast, ease the stick back; too slow, and you should move it forwards. Levelling off should be anticipated as before, but this time by both resetting cruise power and easing back the stick.

Putting it all together

What you have learnt so far is all very well if all your flights (after the point of instrument failure) never involve climbing or descending turns. Fortunately flying is never that boring, and so you need to practise both of these. You also need to learn how to change your speed on limited panel. Any real flight will incorporate an approach to land, and therefore will almost certainly require a combination of all these, and more. Practising real instrument flights, from take-off to touchdown, including an instrument approach, will really hone your skills in this area. The ultimate test for your limited panel flying is an NDB approach in bumpy turbulence.

There is just one more skill you will have to crack before you can class yourself as fully proficient with a limited panel – unusual attitudes. You have probably already explored these inadvertently while learning how to fly on limited panel; now you need to learn how to get the plane back under control properly. There are essentially two types of unusual attitude, which are nose-high and nose-low. This is a better description than 'stalled' and 'spiral dive', because the trick of recovering from an unusual attitude is to determine what the plane will do next. An old flight examiner's trick is to manoeuvre the plane into a highly banked position that is both nose-down and low-speed. If you only look at the speed and conclude that you are near the stall, you will firewall the throttle and push the nose down; this is exactly what you don't need, as your speed will rapidly accelerate out of control.

The first step in recovery from unusual attitudes is to consider your speed – not just your actual speed, but more significantly whether it is increasing or decreasing. If your speed is increasing, you can be fairly confident that you are nosing down, and vice versa. You may be wondering why you do not just look at the VSI, but this does not react fast enough. Similarly, the altimeter will show actual descent but does not respond as quickly as the ASI. There is the possibility that your speed is not changing, in which case you are flying in a steady state, which in turn means that you are climbing, descending or flying level. In these cases all you need to do is roll the wings level and ease out of any climb or descent.

Back to the nasty situations… If you conclude from your increasing speed that you are nose-down, you should immediately close the throttle to help prevent exceeding VNE or overstressing the plane. Next, or ideally at the same time, roll the wings level by watching the turn indicator. As soon as the indicator approaches the 'no turn' position, move the stick firmly backwards to pull out of the dive. Most turn indicators are by their nature imprecise, which you probably didn't pay much attention to before you started flying on limited panel. This will mean that you'll probably need to make a few more corrections to your roll before it is fully under control.

As you pull out of the dive, watch the altimeter like a hawk until it shows that you are level, and immediately ease forwards to hold your altitude or to maintain a gentle climb. You now have the plane under control and should return the plane to your planned heading and altitude, because you have not fully recovered until you have achieved this – you don't want to recover the plane and then get lost.

The second nasty unusual attitude is nose-high, with speed decreasing. In this case, you should immediately apply full throttle and ease forward on the joystick. In this situation you are ignoring the roll for the moment; you need a good flying speed before you tackle roll. Your speed should stop decreasing and then increase. Once you have ample flying speed, roll the wings level and recover to your planned heading and altitude. You need to be careful that you don't convert your nose-high unusual

Nose-high unusual attitude – what would you do?

attitude into a nose-down high-speed one. Nevertheless, you are likely to end up in a shallow dive until you have practised it several times.

Flight simulators are ideal for practising unusual attitudes. Simply set up your limited panel, switch to an outside or side view, then throw the plane around for a little while; then switch back to the panel view, and finally recover. Make sure you tackle both nose-up and nose-down situations.

Some final tips

The more you fly using limited panel, the more at ease you will be with it. Many pilots find limited panel actually easier to handle than full panel, because there is less to monitor and it really focuses the mind on what is happening. It does help your full panel flying too, as it enables you to spot inconsistencies between instruments and to work out what has failed. To help you get to grips with it, here are a few essential principles; they are by no means exhaustive, but should make your limited panel flying considerably easier.

• If a plane is in balance, with the slip ball in the middle, and it is not showing a turn on the turn co-ordinator or turn indicator, it will hold a heading reasonably accurately.

• Flying a plane in trim is vital. You need to be properly trimmed before the instrument fails, so that you don't instantly have an unusual attitude when the AI gives up.

• If a plane is properly trimmed, any variation in pitch will be small.

• Use the altimeter to control your pitch when flying level.

• Use the ASI to control your pitch when climbing or descending.

• Use the turn and slip indicators to control your roll.

• Use the magnetic compass to check your heading.

• Setting the correct power and speed will give approximately the correct pitch in all stages of flight.

• Make very gentle slow changes, unless recovering from unusual attitudes.

• Ideally fly almost hands-off, only lightly touching the controls when necessary.

Unfortunately this requires near perfect trimming, which can prove impossible on some simulators.

Now that you have the full range of skills and a few essential tips, the time has come to really test how well you have mastered flying on a limited panel. The only real way to do this is to start flying with the AI and DI set to fail at random at some point during the following three or four hours. Then set yourself a difficult route to fly in a thick layer of solid cloud, with an instrument approach at the other end. Do this for every flight you take over the next month. If you regularly fly like this, when the failure does eventually happen it will take you by surprise, which is the best possible simulation of reality. You will soon realise that the most difficult part can be noticing the failure before you end up with an unusual attitude. The best way to detect the failure is to scan all your instruments continually, always ensuring that the information they provide is consistent. When you notice that something is awry, you then need to work out which one is telling the truth and then use your newfound skills. ■

Stephen Heyworth

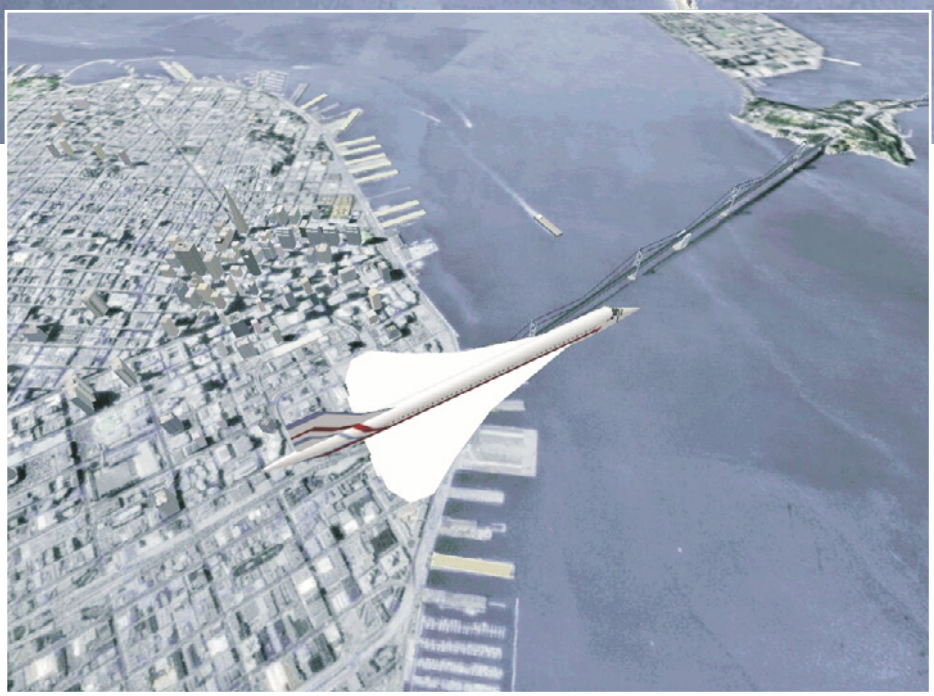
Made it at last – the runway is always a welcome sight

Flight Unlimited II

Unlimited flight on a limited budget!

Seven years ago, Flight Simulator 5.1 was the latest version in Microsoft's series of simulators; with a large number of committed users, and an open architecture that allowed the creation of numerous add-ons, FS5.1 looked invincible. Not everyone, however, was happy with Microsoft's creation. The graphics weren't exactly state-of-the-art, and the default flight models were rather basic. At the same time a completely new flight simulation appeared – one so totally different to anything seen before that it caught everyone's attention. It was developed by a small software company called Looking Glass Technologies, and went by the name of Flight Unlimited, a name that may be unfamiliar to relative newcomers to the FS world.

This revolutionary software package astonished many flight simmers; rather than simple generic textures and flat terrain, Looking Glass Technologies created a flight simulation of stunning beauty; accurately rendered mesh terrain was covered with photorealistic, satellite-mapped textures to produce an almost lifelike depiction of five different areas of the world. These were limited in their range, but clever technology allowed the terrain to be 'mirrored', resulted in an apparently endless expanse of highly detailed and realistic terrain.

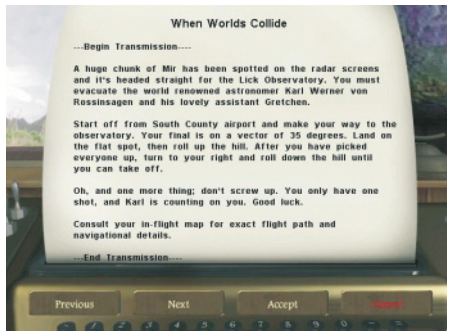


Flight unlikely! An AI Concorde over the Bay area

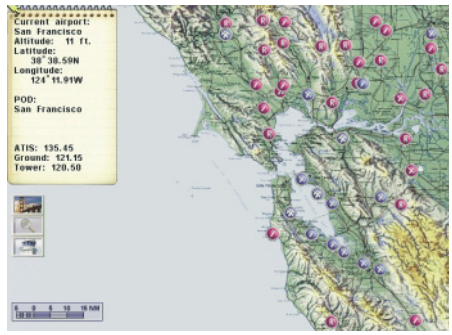
Even more impressive were the flight models of the five available aircraft. The developers had actually simulated the physics of airflow over the wings and control surfaces of the flyable planes, to produce an accurate recreation of real-world flight characteristics that is largely unrivalled in the world of PC flight simulation. The only real shortcoming of Flight Unlimited, apart from the rather small size of its flying environments, was the almost total absence of any real-world objects. This was never perceived as a major problem, however, because Flight Unlimited was originally designed more as an aerobatics simulator. The superb physics modelling was perfect for the complex calculations required to turn and flip simulated aircraft all over the sky!

Flight Unlimited woke up the PC world to the many possibilities inherent in flight simulation and, with this impressive product

Your gateway to budget excellence!


When Worlds Collide
---Begin Transmission----
A huge chunk of Mir has been spotted on the radar screens and it's headed straight for the Lick Observatory. You must evacuate the world renowned astronomer Karl Werner von Rossinsagen and his lovely assistant Gretchen.
Start off from South County airport and make your way to the observatory. Your final is on a vector of 35 degrees. Land on the flat spot, then roll up the hill. After you have picked everyone up, turn to your right and roll down the hill until you can take off.
Oh, and one more thing; don't screw up. You only have one shot, and Karl is counting on you. Good luck.
Consult your in-flight map for exact flight path and navigational details.
---End Transmission----
Previous
Next
Accept

One of the 25 adventures available



Scenery coverage of San Francisco

under their belts, Looking Glass Technologies then decided to take on Microsoft at their own game. Shortly after the release of FS98 (essentially Flight Simulator for Windows 95 with support for 3D accelerator cards), they released Flight Unlimited II, and it was a corker. Looking Glass Studios, as the company was now known, had decided to develop the next generation of civilian flight simulators, and FUII was well ahead of its competitors when it was released over four years ago. In fact, so advanced were its many innovative features that it remains one of the best PC flight sims, and is currently available on the Sold Out budget label for the almost unbelievable price of just £4.99. With this in mind, it seems an appropriate time to take another look at this superb piece of software.

The most immediately striking aspect of FUII is the quality of the terrain graphics; 10,000 square miles of superbly rendered, satellite-mapped San Francisco Bay area terrain are available to explore, and the detail is amazing. The resolution of four metres per pixel is so good that many local residents can actually identify their own homes. The scenery area contains a variety of features, from the beautiful blue waters of the Pacific Ocean and San Francisco Bay to several mountain ranges, and a section of California's Central Valley. The sheer pleasure of flying in FUII means that it's very easy to just admire the scenery below and forget about the other aspects of virtual flight. The same mirroring technology that was present in the original Flight Unlimited is used here to provide the high-resolution terrain. But FUII has more to offer than just impressive scenery graphics.

If you select a major airport as your starting location, you will immediately notice the level of background chatter on the radio when you take the pilot's seat. You'll also notice another fascinating aspect of FUII – AI planes flying around the scenery area. Until the release of FS2002, this was a feature completely absent from Microsoft's flight simulators; Looking Glass Studios had it nailed way back in December 1997!

The superb ATC system helps to bring the FUII experience to life. Pressing the space bar reveals a few options at the top of the screen (based on the radio frequency

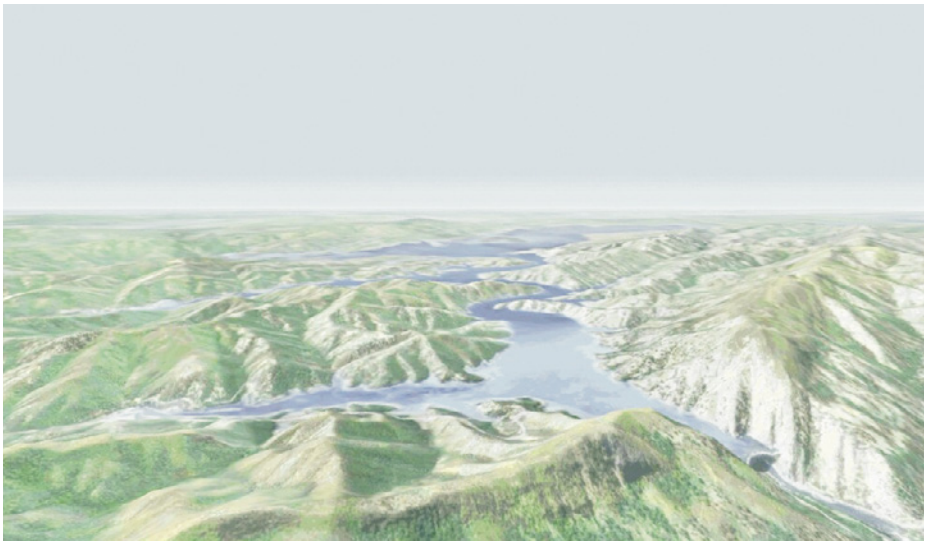
The full-size Baron (above) and Arrow panels

selected). When you are parked, this will contact Ground Control, and you'll be asking for taxi clearance to the active runway. The controller will initially respond by asking you to "monitor ATIS" (Air Traffic Information Service), which provides information regarding weather, the active runway and traffic patterns, and requires the selection of a different radio frequency. The ground controller will then ask you to taxi

to the active runway via certain taxiways, and also to stop short before crossing any other runways that are being used; these instructions must be followed correctly, otherwise you're likely to be reprimanded by the controller.

Once you are airborne, further impressive aspects of FUII are revealed. Whilst lacking the complex flight physics of its predecessor, FUII does simulate very convincingly effects such as air turbulence and wake turbulence (when you pass too close to another aircraft). These may seem like minor attributes, but they contribute enormously to the realism factor. Five flyable planes are included – the de Havilland Beaver floatplane, Cessna 172, Piper Arrow, Beechcraft Baron and P-51D Mustang.

The de Havilland Beaver is a joy to fly…



…and there's no shortage of water

No fog today, but rain effects are excellent

In view of the widespread disappointment with floatplane flying in FS2002, it's worth mentioning the simulation of floatplane physics in FUII. Although the de Havilland Beaver is the only flyable floatplane available, there are three maritime airports from which you can fly, and it really is an amazing experience, and one which allows access to all those small lakes and rivers throughout the entire scenery area. From your place in the cockpit at any one of these airports, you'll notice that you are already in motion. Your plane will be rocking gently as it sits in the water, and the sound of small waves lapping against the sides is utterly convincing. Applying power to the Beaver to initiate take-off will result in the aircraft pitching back and forth as it hits successive waves, and you'll hear the sound of water rushing past the pontoons.

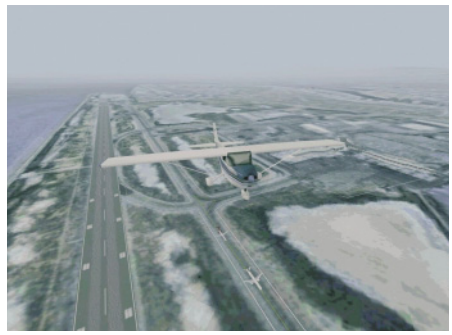
Weather conditions can be customised from the Quick Flight menu screen; wind speed, cloud cover and the amount of rainfall can all be modified, and will affect accordingly the amount of air traffic operating. Let's face it, how many planes are likely to be flying around in a fierce thunderstorm with 50mph winds? Lightning can also be turned on or off, from the main screen's Options menu, where screen resolution, air traffic density, terrain detail and other features can also be changed.

While individual clouds aren't quite as convincing as those in more modern simulators, the weather effects in FUII are at their most striking when it's raining and the sky is overcast. Sitting in your parked aircraft at San Francisco International during a thunderstorm is actually great entertainment by itself; the sound of rain drumming on the roof of your plane is excellent, and the raindrops running down the windows are highly convincing. Thunder and lightning effects are wonderful, with multiple rumbles of thunder fading into the distance after a lightning strike. Add this to the radio chatter of airline pilots and ground controllers, and you have one of the most realistic simulations ever of an airport environment.

Other features of FUII can be accessed from the Airport option on the main menu; this takes you to a picture of the FBO (Fixed Base of Operations) at the current airport, where the main map and further options are available, including several flying lessons and a collection of 25 adventures. These range from tests of flying skill (landing in bad weather, canyon flying and so on) to more exotic exploits such as picking up escaping prisoners from Alcatraz at night in the Beaver floatplane, or rescuing an astronomer from the Lick Observatory before a piece of the Mir space station crashes into it!

How's that for a city?

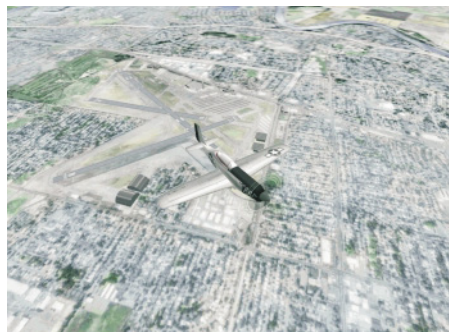
Central Valley looks just as good as the city



The weather in Oakland is usually better than this

AI Learjet over Mount Brisbane

Mount Diablo from the SF scenery



No combat available, but the Mustang flies well

The main FUII interface is actually far more intuitive and user-friendly than in any of Microsoft's releases; single key commands allow access to a range of alternative views (VFR cockpit, IFR cockpit, free-floating external camera, fixed camera etc.), and the zoom keys can be used in conjunction with the free-floating camera to provide a virtually limitless selection of viewing positions; this is greatly preferable to having to cycle through four different views using the same key or joystick button. The VFR cockpit view is one of the best ideas ever devised for a flight simulator; pressing the [F2] key reveals a panel around half the size of the full IFR cockpit view, providing a much improved view from the cockpit. This may seem trivial to some, but many VFR pilots are glad not to have a full-size panel obscuring scenery this impressive.

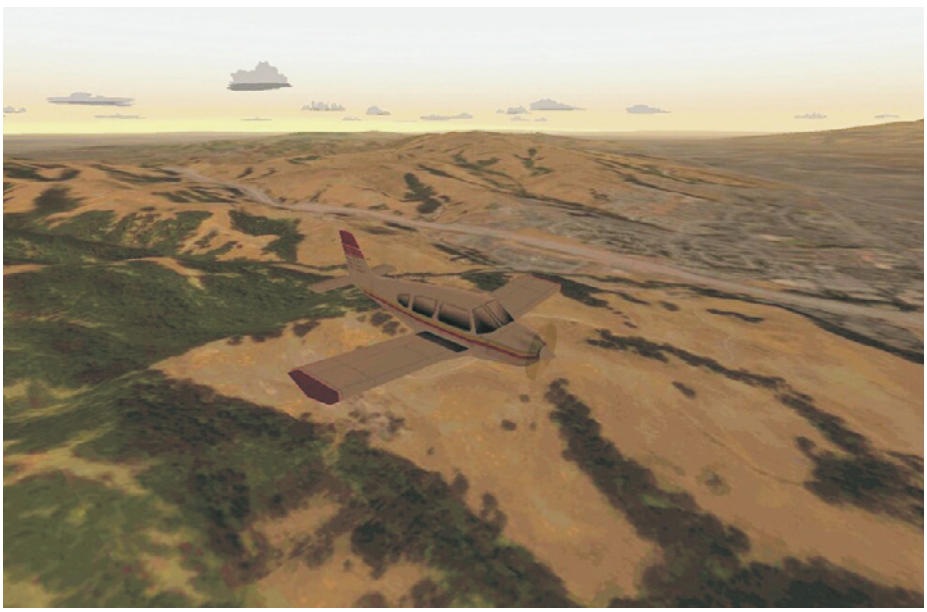
FUII isn't without its faults. Some may find the available flying area to be rather restricted, and night flying is difficult due to a complete lack of ground lighting (except at major landmarks and at airports); the AI plane models are rather basic when compared to the impressive detail of their FS2002 equivalents, and there are hardly any add-ons available. This was a mistake on the part of the developers, and was only partly corrected when they released Flight Unlimited III in 1999. This sequel to FUII is long overdue a budget release, but is sadly currently unavailable as a result of legal and contractual wrangles between the various parties concerned.

Nonetheless, there's a very active FUIII community still operating at the AVSIM website (www.avsim.com), as well as a particularly friendly forum. Flight Unlimited III still has many devotees, who are constantly developing add-ons and refinements, a large number of which are available in AVSIM's library. These range from extra flyable aircraft (generally much improved over the default ones), to new panels and interior graphics, modifications to the AI planes and airports, and a wide range of scenery packages that include added trees and buildings, extra airfields (both real and fictional), and a greater number of animated objects. Some freeware authors have kindly allowed us to include on our Cover CD two packages which demonstrate the quality of the software still being developed for FUIII – a very nice DC3 package including several variants, and an excellent AI enhancement package.

The FUII San Francisco scenery can also be used in Flight Unlimited III, and this area also has been massively upgraded. If you own a copy of FUIII that you haven't paid much attention to recently, you'll be surprised at how a few visits to the website can upgrade it to an entirely new level, and you'll find all the help you might need from the forum members.

There's no telling whether FUIII will finally be re-released, or whether there will ever be a Flight Unlimited IV – we can only hope so. But with FUII available for a mere fiver, this is the ideal time to take a look at a wonderful sim that still has much to offer. ■

Chris Low



Arrow at dusk – scenery effects are impressive

Simming on a shoestring

Come on up – the price is right!

Flick through the current recommended specifications for flight simulators and their add-ons and you may be forgiven for thinking that the average simmer spends their time in a constant round of PC updates. One might presume that PC pilots buy a new graphics card on a monthly basis, a new processor a couple of times a year, and a new PC every Christmas! This is not necessarily the case, however, and when FS2000 was launched, most of us discovered that even the fastest PC on the shelf wasn't up to running the newest sim in the skies. Times have changed and FS2002 is much more processor-friendly, but what if you haven't splashed out on a 1GHz+ machine? Can you still fly smoothly? Or, if you have got some new kit, what do you with your old 400MHz PC, which still runs nicely? Before you consign it to the loft or the local tip, you might want to consider giving it a second lease of life with some software that won't break the bank.

The budget or 'value' software trade has become big business in recent years as major publishers have found that, once their leading games have been pulled off the shelves at full price, they can get them back on again at a lower price and sell to a different audience. What has helped this trade is the relative stability of platforms. Between Windows 3.1 and XP we've had a relatively long period when products developed for Windows 95 would run OK on Windows 98. Graphics cards and DirectX issues aside, most software from five years ago will run on a relatively new PC, unless it sports Windows XP or a very recent version of DirectX. You can read about possible ways of getting round these hurdles elsewhere in this issue, but are these titles any good, or are we dealing with a glorified car-boot sale?

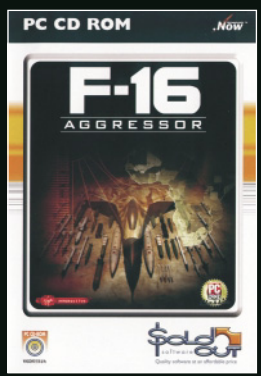
We sampled a range of titles from three budget specialists, and the results were very rewarding. All the software was tested on a trusty (but rusty) PII 266MHz PC running Windows 98 and an 8Mb graphics card of no fixed manufacturer. This poor waif has suffered many indignities over the years, but it was more than capable of running everything we chucked at it. It's worth remembering that modern high-specification graphics cards won't necessarily improve on the looks or the frame rates, as many older titles don't use hardware acceleration. They do, however, certainly compare favourably with a console, so for about £50.00 you could buy a PC from the small ads and soon have your very own Station of Play for a modest sum, as well as a good selection of titles to run on it. As the marketing man at the local second-hand shop might say, "Ybox when you can PC?"

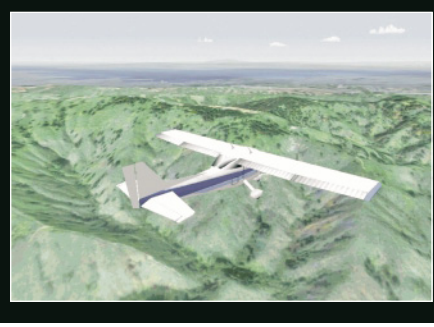
NEVER KNOWINGLY OUTSOLD

Website: www.sold-out.co.uk

Sold Out software
Quality software at an affordable price

Sold Out are the recognised experts in re-publishing older games, and they have built up a huge portfolio of popular titles that sell for £4.99. With free postage in the UK, and offers such as 'three for £9.99' on their website, you certainly get some value. Their flight sim titles are F-16 Aggressor, F-16 Fighting Falcon, Joint Strike Fighter, Red Baron 3D, Flight Unlimited II and F/A-18E Super Hornet. All these sims worked fine with Windows 95 or 98 and Red Baron 3D still looks good, despite the passage of time. Sold Out put their own interactive installer on their software and we were very impressed with the slick (and modern-looking) interface, as well as the very efficient Help system that we used when we tried to install Red Baron onto a laptop. Granted, it told us that the fault we encountered was due to Windows XP (which it was) and there was no cure, but how many other install programs can you think of that are this efficient? It even reminded us that we could get a refund of our £4.99 if the software wouldn't run. Low-cost they may be, but certainly not cheap.





FOCUS ON VALUE

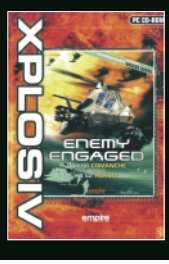
Website: www.focusmm.co.uk

Focus are another specialist budget label, best known for 'leisure software', collections of fonts, clipart and the like, but they also publishes a few games, including Fighter Squadron and Flanker 2.0 at £9.99 each. There's still an amazing level of interest in Flanker 2.0, about which we receive far more enquiries than for other older titles, perhaps with the exception of Jane's WWII Fighters (come on someone – get that out on budget!). They've got a couple of other 'flying' games such as Hell Copters and Plane Crazy, but these aren't really in the same league. A quick scan through their catalogue also reveals Dreams of Flight, Air Combat World War II and Air Assault – Nam to The Gulf. These are all £9.99 'knowledge' CDs and contain videos, interactive panoramas and lots of history. Good value when you consider the cost of a hardback reference book or a video, and some of them even include mini flight sims!

SON OF THE EMPIRE

Website: www.xplosiv.net

Empire are a well known games publisher, but a recent entrant to the value software market, and are re-publishing older Empire titles as well as some from other publishers. Like Sold Out, they are concentrating on games, and their Xplosiv label features a few familiar flight sims. You'll find old favourites like Enemy Engaged (Comanche Hokum), Enemy Engaged (Apache Havoc) and MiG Alley at £9.99 each, Airport Inc. and Fly! in a double pack at £9.99, as well as Battle of Britain (still on the main Empire label) for £14.99. Once again our wheezy 266 was able to get airborne with all these, and it's noticeable that MiG Alley can still cut the mustard with modern software, certainly on a fun factor alone. EE Comanche Hokum is still a good chopper sim and well worth a tenner if you want to get hovering. Don't expect to see any of these sims fly on XP (unless you've got the patience of a saint and a lot more luck than we had) but for Windows 95 and 98 systems you've got some winners.



Any more in the suitcase before we get moved on?

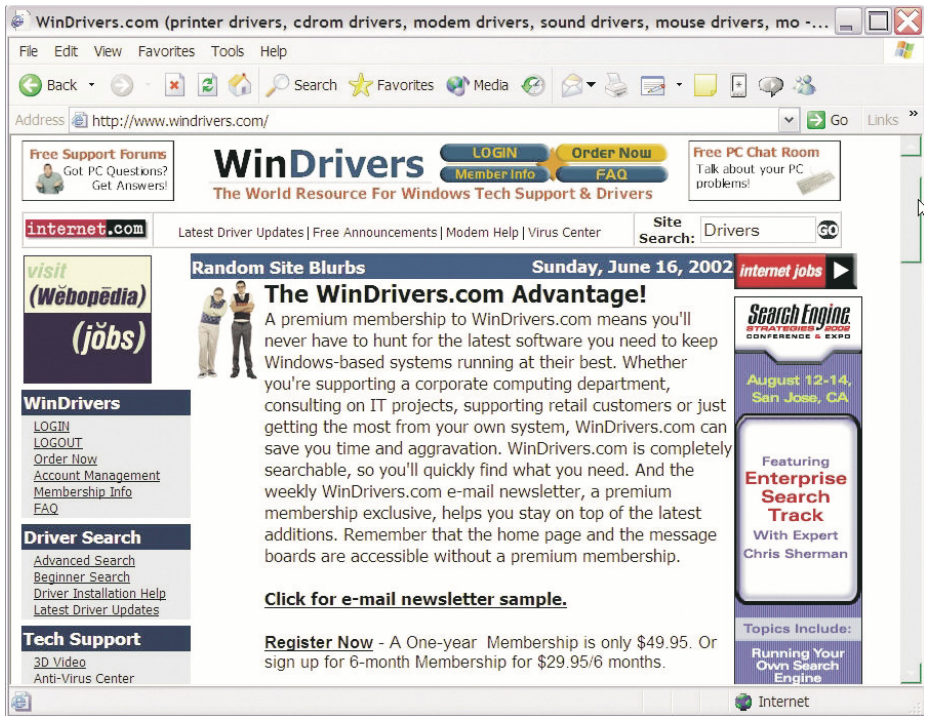
There's lots more budget software about, and a quick search around any of the big online retailers usually reveals a few gems. Canadian publisher Global Star Software (www.globalstarsoftware.com) has a few budget items worthy of note, including Red Ace Squadron and Airport Tycoon at $19.99 (£13.00 approx.) each. With large capacity PCs that you can set up with a dual boot (running Windows XP and another version of Windows/DirectX at the same time) there's no reason why you shouldn't continue to enjoy the classics for years to come, so dust off those old boxes or spend the price of a couple of pints on some great sims. ■

Derek Smalls

Flight Simulation and Windows XP

We've all been there. After reading a preview of the best flight sim ever, you wait months for its release, and then finally the glorious day arrives. Credit card in hand, spouse safely ensconced in a nearby clothes shop, you rush eagerly to the shop, grab the box, and hand over the magic card of joy. Then you patiently wait until you get home, fire up the computer, throw the shiny new CD in the drive and then the pain starts…

XP = Experiencing problems?


WinDrivers.com (printer drivers, cdrom drivers, modem drivers, sound drivers, mouse drivers, mo -...
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Featuring Enterprise Search Track With Expert Chris Sherman
Topics Include:
Running Your Own Search Engine
WinDrivers
LOGIN
LOGOUT
Order Now
Account Management
Membership Info
FAQ
Driver Search
Advanced Search
Beginner Search
Driver Installation Help
Latest Driver Updates
Tech Support
3D Video
Anti-Virus Center
Internet

WinDrivers – your one-stop resource for up-to-date drivers

Hour after hour of trying this and that to get the darn thing to run finally culminates, at best, in a jerky graphics experience that would make even the hardiest seafarer feel queasy or, at worst, a return trip to the shop to get a refund.

The situation, for the next few months at least, looks set to get worse. In the normally quiet release period between May and September, many publishers will look to re-release older titles, while hardware manufacturers will ship shiny new machines with new installations of Microsoft's Windows XP operating system. XP, as you are probably aware, is Microsoft's latest incarnation of the graphical operating system we've all grown to both love and loathe. It purports to be more resilient to crashes, easier to use, faster to operate, and should – according to the marketing blurb – take us well into this new millennium with a user environment that will make our PC-using lives faster and more fun. The truth of the matter is that, as with all new operating system releases, XP is new, and thus less compatible with our sims than the previous ones.

It's a nasty chicken and egg scenario; you may want to stick with an older OS to guarantee that your library of titles will work, but to do so means living without the updates that Microsoft always release for their new operating systems, and also living with the fear that the newest and best titles may not work on your 'legacy' kit. What do you do? Switch to the latest and greatest, and stop using your favourite old sims, or stick with the old ones and risk not being able to use the new releases?

There's been plenty of press and Internet coverage of XP's compatibility issues, but the truth is that there's quite a lot you can do to get those old sims to run. There is no magic bullet that can cure all ills, though, and not every single sim you own will work perfectly. But having the knowledge to at least be able to try is better than enduring the helpless feeling thousands of us suffer from one day to the next. If you've got XP already, or are going to get it soon (it will come with your next PC), then the tips in this article should help you overcome most of the problems you may encounter.

First, though, bear the following points in mind when you next buy a sim, whether a brand new one or a re-released title. Developers are not generally in the habit of writing their software on the newest and most up-to-date technology out there; it's hard enough to write a sim in the first place, without having to fight with pre-releases of operating systems, so most stick with the tried and tested, and hope the testers will find the compatibility issues later in the development process. Since most standalone sims these days take an average of two years to get to market, this means that the ones which will arrive in the shops tomorrow were probably written on the operating systems of choice two years ago – Windows 2000 and Windows ME. Until XP matures you are unlikely to find titles that can be guaranteed to work with it on all machine configurations. Always buy from a store that has a 'no questions asked' return policy. We're not plugging them here, but Electronics Boutique (now called Game) is fantastic in that respect. If you have problems getting your purchases to run, you can return them without any hassle at all. Many other companies offer a similar policy, and our advice is to avoid anyone who doesn't.

The golden rule

To stand the best chance of getting a piece of software to run on XP, the golden rule is this: 'Latest IS greatest'. Make sure you have the latest updates to Windows XP, the most recent updates and patches for the sim itself, and the latest updates to your graphics,

sound, and other hardware, drivers. A great many people read the word 'drivers' and panic; it implies a certain level of knowledge and familiarity with the inner workings of the machine, that many people just don't have and don't want to have. Don't panic – it actually means something very simple.

Most PCs are different from each other. Machines are sold with a plethora of different sound cards, video cards, hard disks and motherboards, but we all expect each one to work identically to every other PC out there; that's a tall order for software developers to meet. It's currently impossible to write software that automatically knows just how to work with every single video and sound card available, so instead Microsoft use drivers. These plug into the operating system and allow developers to ask Windows itself to do the hard work. You could ask Windows to play a sound, for example, and Windows will get the appropriate driver to actually take control of the sound card to do the tricky stuff. So, the first step in getting your games to run is to make sure you have installed those drivers. Obviously there are different drivers for different versions of Windows, so make sure you get the XP versions.

A useful place to get new drivers is the free website www.cnet.com. Alternatively, try www.windrivers.com, which you will have to pay for, and which is nowhere near as confusing as it looks. At the bottom left of the page is a list of items under the heading Tech Support. Use that section to find your hardware devices and download the latest patches.

You may find that some manufacturers don't yet support Windows XP. In that case you can download and try the latest Windows 2000 drivers; XP is based on Windows 2000 so, while it's not guaranteed, you may find that some Windows 2000 drivers work just fine under Windows XP. You will be warned when you install those drivers in XP that they are not 'certified'. Don't worry about this; Windows XP is able to 'roll back' potentially damaging changes you make to your machine.

In XP, click on the Start button at the bottom left of the screen, then click through Programs, Accessories and System Tools, and choose the System Restore option. You'll be presented with something similar to Figure 1.

When you click on the Next button you'll be presented with a list of Restore Points (as in Figure 2), so simply choose the date and time at which you know the machine was last working correctly, and hit the Next button to start the restore process. Anything done to your machine since that point will be 'forgotten'. This won't affect any files you've created in Word, or any saved games; it only affects any software or drivers that you've installed.

Following the 'latest is greatest' theme, XP can also automatically download updates to

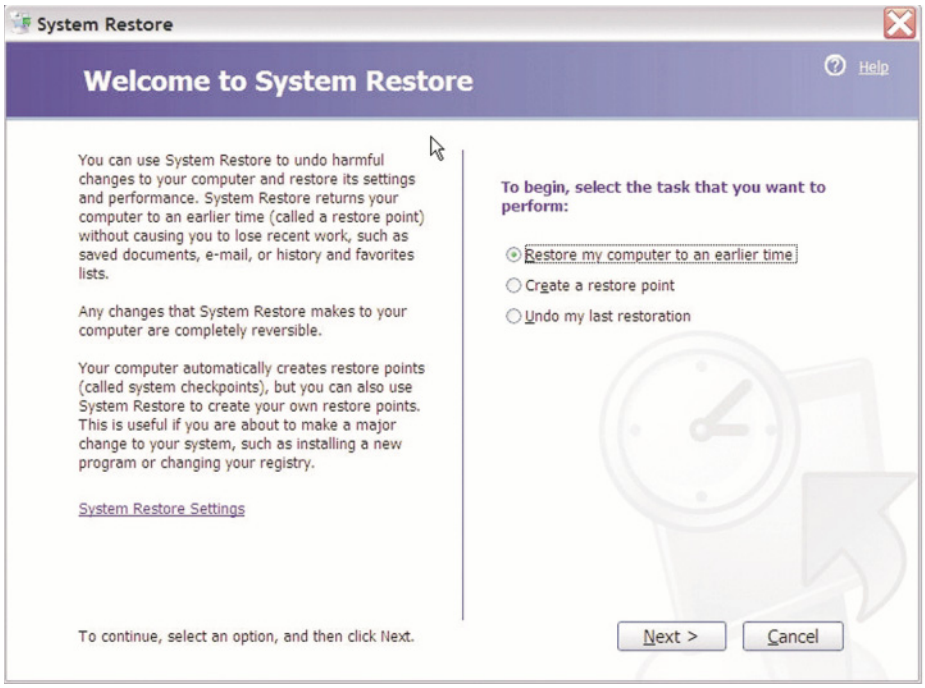
System Restore
Welcome to System Restore
Help
You can use System Restore to undo harmful changes to your computer and restore its settings and performance. System Restore returns your computer to an earlier time (called a restore point) without causing you to lose recent work, such as saved documents, e-mail, or history and favorites lists.
Any changes that System Restore makes to your computer are completely reversible.
Your computer automatically creates restore points (called system checkpoints), but you can also use System Restore to create your own restore points. This is useful if you are about to make a major change to your system, such as installing a new program or changing your registry.
System Restore Settings
To begin, select the task that you want to perform:
Restore my computer to an earlier time
Create a restore point
Undo my last restoration
To continue, select an option, and then click Next.
Next >
Cancel

Figure 1. XP's useful System Restore facility

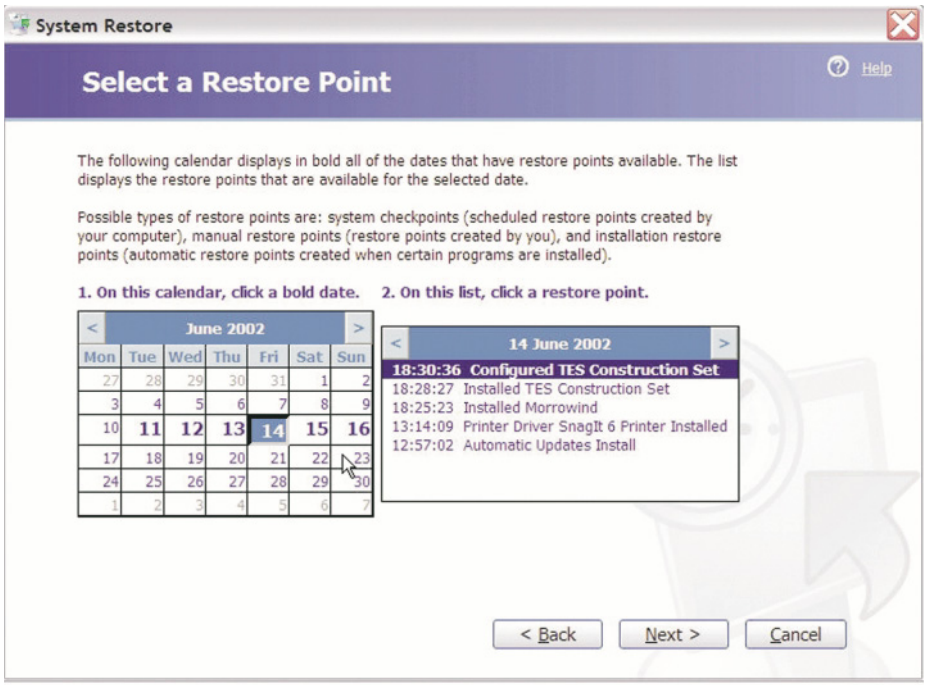
System Restore
Select a Restore Point
Help
The following calendar displays in bold all of the dates that have restore points available. The list displays the restore points that are available for the selected date.
Possible types of restore points are: system checkpoints (scheduled restore points created by your computer), manual restore points (restore points created by you), and installation restore points (automatic restore points created when certain programs are installed).
1. On this calendar, click a bold date.
2. On this list, click a restore point.
June 2002
Mon Tue Wed Thu Fri Sat Sun
14 June 2002
18:30:36 Configured TES Construction Set
18:28:27 Installed TES Construction Set
18:25:23 Installed Morrowind
13:14:09 Printer Driver SnagIt 6 Printer Installed
12:57:02 Automatic Updates Install
< Back
Next >
Cancel

Figure 2. If you make a mistake, simply restore your previous System settings

itself. Microsoft is fully aware that there are compatibility issues with some older software, and regularly releases updates for the operating system designed specifically to address these issues. Microsoft understands that sims/games are a major bone of contention, and so these compatibility updates do address problems simmers are experiencing.

To enable Windows Update (the part of XP which can do this), click the Start button once again, and choose Control Panel. By default, the control panel in XP looks like the one in Figure 3. Click on 'Switch to Classic View' to make it more confusing, but infinitely more powerful. In Classic View, find the item called System and double click

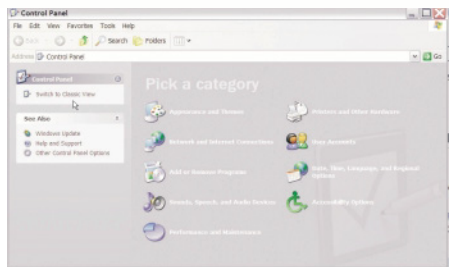

Figure 3. Control Panel in XP – start here for Windows Update

it; you'll see the System Properties appear, as in Figure 4. At the top of the panel are a set of 'tabs', just like the tabs on folders in a filing cabinet. Click on the one labelled Automatic Updates, and make sure that automatic updating is turned on.

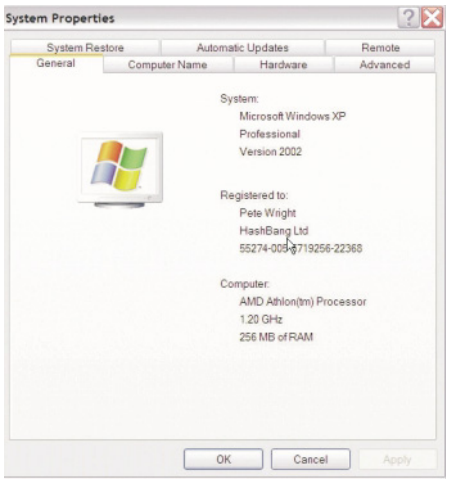

Figure 4. Windows XP's System Properties

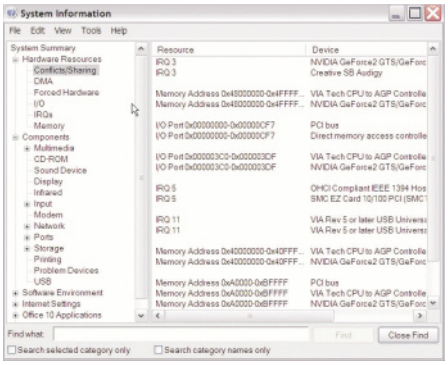

Figure 5. System Information will tell you exactly what's inside your PC

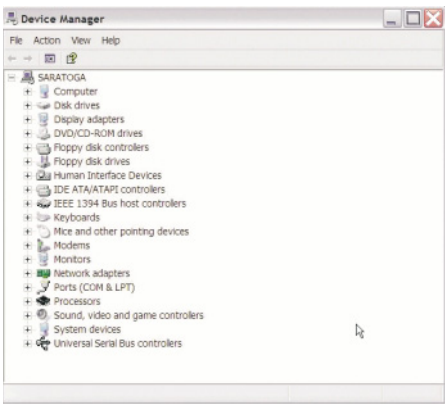

Figure 6. The Device Manager is another source of PC information

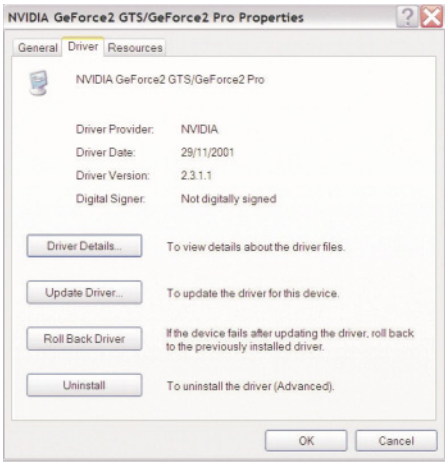

Figure 7. Driver information – essential knowledge

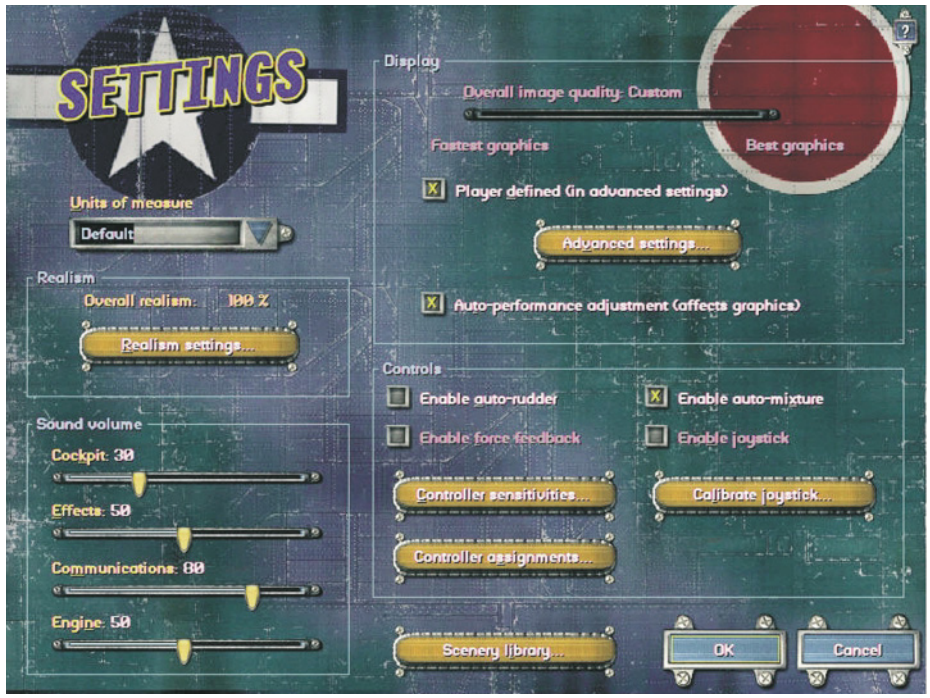

Figure 8. Font smoothing is wonderful when it's required; otherwise it's not so useful

Some people are a little afraid of this option, since there was some speculation that Microsoft is using this feature to collect personal information about users. They are not. You can enable this option and sleep at night safe in the knowledge that Microsoft is not spying on you just because you want your machine to stay up to date. To quote a recent television commercial, it's not the wardrobe monsters you need to worry about, it's the burglars that come in through the bedroom window.

Drivers, versions, help!

You probably don't have a clue about the exact model name and number of each and every component inside your PC. To be honest, few people do. XP can help you in identifying just what's inside your machine, and how up to date it is, through a feature called System Information. Before you go online and start hunting down drivers and updates, it's worth grabbing and a pen and paper, running System Information and making a note of what you find there.

Click on the Start button again, then All Programs, then Accessories, and then System Tools. Select System Information from the list of programs, and you'll see the System Information program appear (Figure 5). By working through the list on the left you can find out exactly what hardware is in your machine, and which versions of drivers are in use. Alternatively, go back into System Properties and click on the Hardware tab. A set of buttons will appear, so click on the one labelled Device Manager and the screen in Figure 6 will appear.

Although Windows is frequently unable to solve automatically any problems your machine may have, it is able to inform you that something is wrong. Hardware devices with problems are usually shown in this list with a little warning ! symbol beside them.

Just double click on the device which you know, or are being told, is giving you grief and take a look at its driver information tab (Figure 7).

Here you can roll back the driver (if you've made a change that you want Windows to forget about), update the driver with any new one you may have just downloaded, or just find out more highly detailed information about a driver for making a support call, or even for just browsing files online to find out which would be the best ones for you to download.

Incidentally, there are a number of ways to update a driver, and which one you use really depends on the hardware you are updating. ALWAYS follow the manufacturer's instructions on how to install new drivers – these will be on the website when you download the updates.

Fonts and smoothing

XP is fantastic at making dull things look great. This article, for example, is being typed into Word at a massive resolution of 120 dots per inch using ClearType, and it looks excellent on screen. Straight out of the box, XP uses 96 DPI and no font smoothing, which is actually just what you want if you intend to try using older sims. Font smoothing makes text on screen look smoother, but it does so by surrounding each letter on the screen with dots of slightly paler colours, to remove the inevitable jagged lines that PCs tend to display on curves and diagonals. Run up a sim that doesn't know about font smoothing, though, and the result is very unattractive, as you can see in Figure 8.

Notice how all the text has a rather annoying purple hue to it. This can also extend into the simulator graphics, making those all-important wingman messages in

multiplayer games almost impossible to read. Worse still, because Windows jumps in and performs some additional onscreen drawing each time text is displayed, the net result is slower overall performance.

The DPI issue can also cause problems with older titles. If your chosen sim expects you to use 96 dots per inch to display something, but Windows is set to use more, then you end up with dialogues that just don't look right; images disappear off the dialogues, captions on buttons are huge to the point of being unreadable, and so on.

Checking and fixing this is quite easy. First, the ClearType issue; right click anywhere on the Windows desktop, and select Properties from the menu that appears; you'll be presented with the Display Properties window (Figure 9). Click on the Appearance tab at the top of the window, and then click on the Effects button that appears; you'll see Figure 10. Pay attention to the second option down, the one that says 'Use the following method to smooth edges of screen fonts:'. Make sure that this option is turned off (i.e. there isn't a tick in the box beside the text) and click the OK button. This should deal with the nasty, slow font smoothing problem.

Now for the confusing DPI problem. Back in the Display Properties window, click on the word Settings at the top of the window, and then click on the Advanced button that appears; you'll see a window similar to Figure 11 appear. Notice where it says 'DPI setting:', and underneath this 120 DPI. Make sure yours says 96 DPI, then click on OK to close the window, and OK again to close down the video properties. You may be asked to reboot at this point, so go ahead and do so.

Program Compatibility Wizard

You may find that after trying all these steps, which should clear up a lot of problems with older titles, your sims still don't work. Unfortunately there is a chance that, no matter what you do, they will never work. They may make use, for example, of quirks in older versions of DirectX that just won't work on XP's DirectX version 8.1. There is something you can try, though, and it's called the Program Compatibility Wizard.

Select the program giving you problems, just as if you were going to run it, but instead of left clicking it to run, right click it to display a menu, and then click on Properties, the last item on that menu. A window will appear with three tabs at the top called General, Shortcut and Compatibility. Click on the Compatibility tab and you'll see the dialogue shown in Figure 12.

Now the trial and error starts. At the very least, make sure that the 'Disable visual themes' setting is selected, to prevent your games from trying to assume the Windows XP look and feel. Then click on the box beneath 'Run this program in compatibility mode for:', and choose an operating system from the list available.

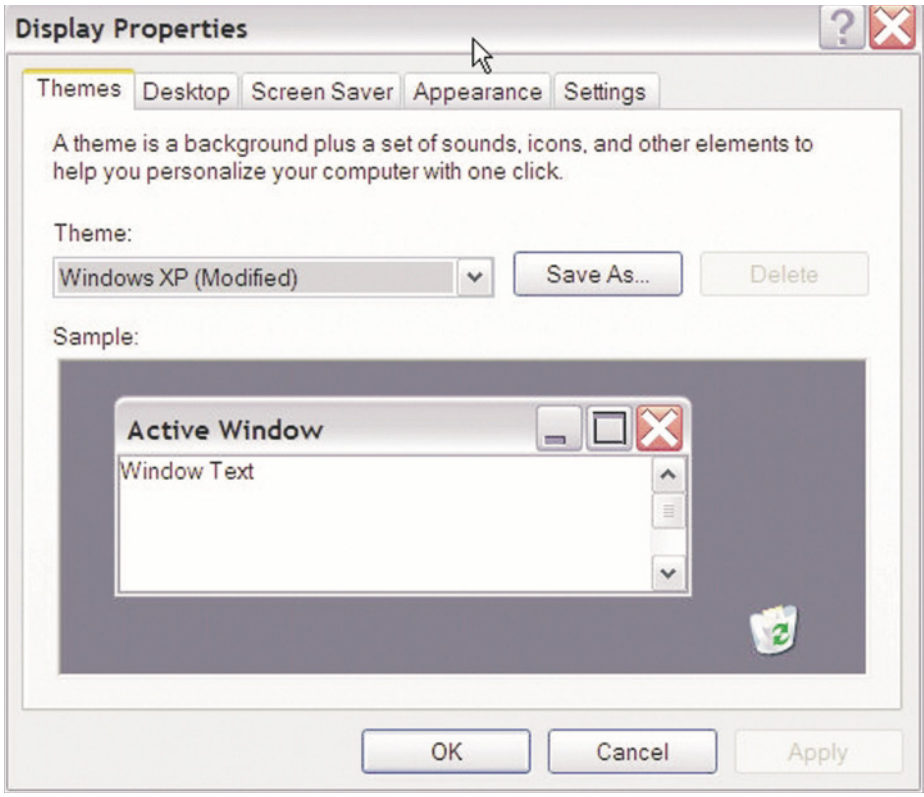

Figure 9. XP Display Properties

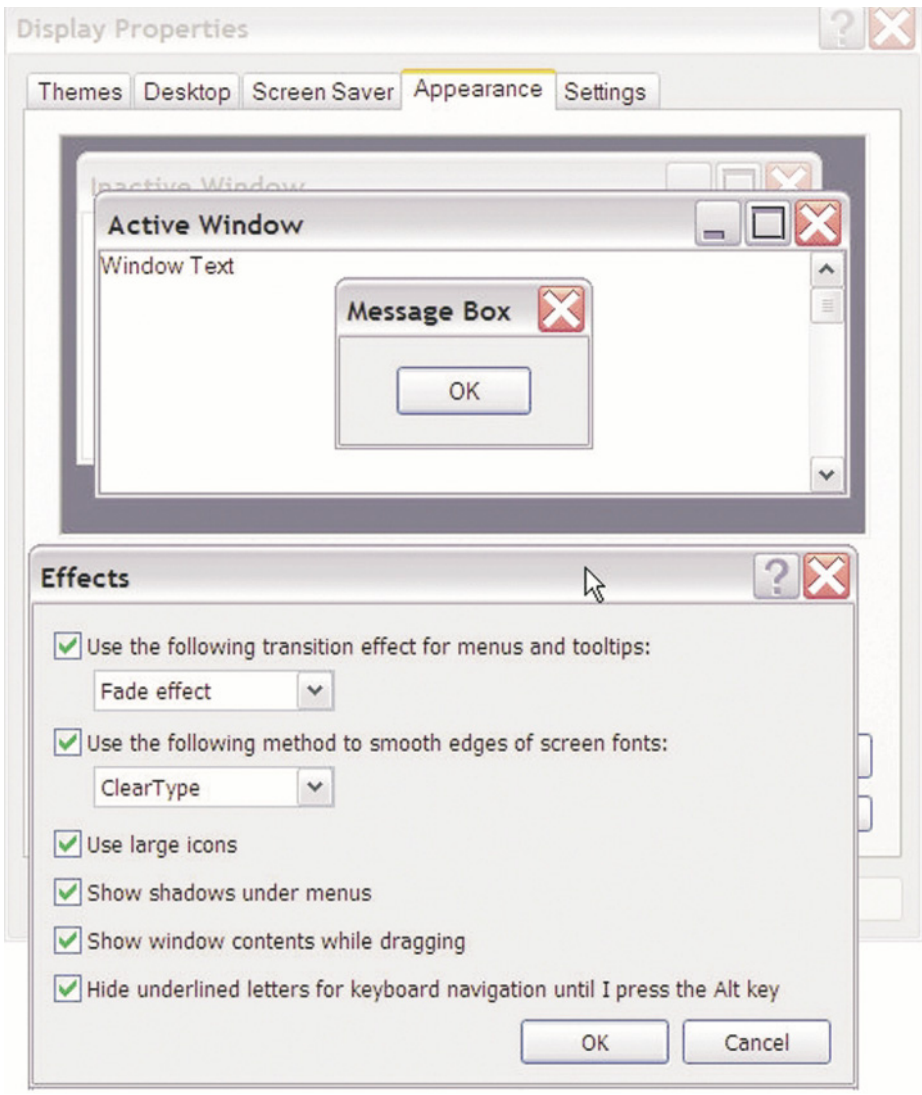

Figure 10. Remove smooth edges of screen fonts here

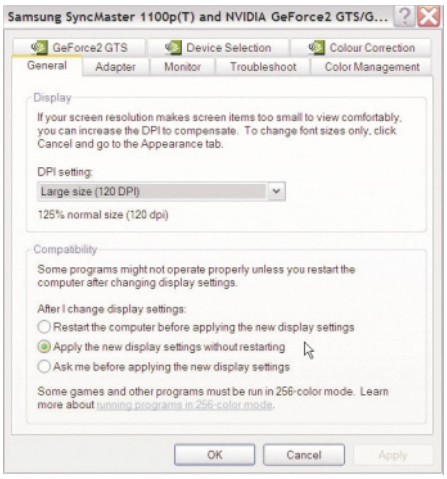
Samsung SyncMaster 1100p(T) and NVIDIA GeForce2 GTS/G...
GeForce2 GTS
Device Selection
Colour Correction
General
Adapter
Monitor
Troubleshoot
Color Management
Display
If your screen resolution makes screen items too small to view comfortably, you can increase the DPI to compensate. To change font sizes only, click Cancel and go to the Appearance tab.
DPI setting:
Large size (120 DPI)
125% normal size (120 dpi)
Compatibility
Some programs might not operate properly unless you restart the computer after changing display settings.
After I change display settings:
Restart the computer before applying the new display settings
Apply the new display settings without restarting
Ask me before applying the new display settings
Some games and other programs must be run in 256-color mode. Learn more about running programs in 256-color mode.
OK
Cancel
Apply

Figure 11. Older sims will benefit from a smaller DPI setting than this

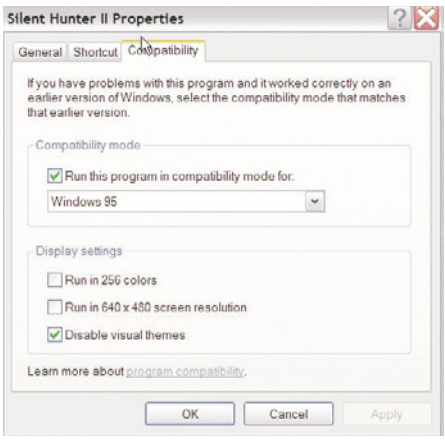
Silent Hunter II Properties
General
Shortcut
Compatibility
If you have problems with this program and it worked correctly on an earlier version of Windows, select the compatibility mode that matches that earlier version.
Compatibility mode
Run this program in compatibility mode for:
Windows 95
Display settings
Run in 256 colors
Run in 640 x 480 screen resolution
Disable visual themes
Learn more about program compatibility.
OK
Cancel
Apply

Figure 12. If all else fails, program compatibility may get you up and running

It's best to start at the bottom of the list and work up, so try Windows 2000 first, and click OK. Run the program and see what happens. If problems persist, go back and choose an earlier operating system, and keep repeating this process until, hopefully, it works.

If none of the options work, select Windows 95 as the operating system and also click on the boxes beside 'Run in 256 colors' and 'Run in 640x480 screen resolution', and again try running the program.

And finally…

If you have followed all the steps above (getting the right drivers, checking the DPI and font smoothing options, and setting the Compatibility Wizard) and your sim still doesn't work, then you may be completely out of luck. While these steps can get the majority of sims running, there are still a few that present difficulties. When they go wrong, however, you'll get an error message on screen asking if you want to send information to Microsoft; always answer 'Yes' when presented with this choice. First of all it teaches Microsoft the error of their ways for including such an option in XP, but more importantly it adds to the incompatibilities database held by Microsoft. They are gradually working through that database and releasing fixes – fixes that Software Update can automatically install onto your machine.

There is still one category of games that we haven't mentioned – DOS games. Good old-fashioned, what-the-heck-is-Windows, type C:\Setup DOS games. You can play with the Compatibility Wizard with these games and, if you try enough permutations, they may work. Even the original Silent Hunter could be made to run, albeit without any sound. At the end of the day, though, there is a limit to just how compatible an OS can be, and it's fairly reasonable, we think, not to expect Microsoft to offer full support for an operating system that was phased out eight years ago. ■

Peter Wright

So will they or won't they…?

Individual PC configurations, and particularly factors such as 3dfx and DirectX variants, will all have some bearing on which sims can be made to run acceptably in XP, but here's a rough guide to the likely results.

If all else fails, you can set up a dual boot between XP and older operating systems; get the very latest version of Partition Magic to split your hard disk in two, and install 95 on one partition with DirectX 5, for example, and leave XP as it is on the other.

Windows 3.1 – forget it

Windows 95 – maybe, but it's a long shot

Windows 98 – a good chance of success after some tweaking

Windows 98SE – better than Windows 95

Windows ME – as good a chance as with Windows 98, and probably better

Windows 2000 – Problems are unlikely

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Extending Flight Simulation with gmax

Part 2: From gmax into FS2002

You've created it – now install it!

In the last instalment of this literary duet we showed you how to install and configure gmax ready for use; it wasn't rocket science, by any means, but it's confusing enough to cause more than its fair share of grief. In this issue we'll show you how get the fruits of your creative labours into FS2002, whether those fruits are scenery or aircraft.

Requirements

Before we start, we'd better get the excuses out of the way. We did a quick search on Amazon.com, before putting fingers to keys, for books about 3D Studio Max, gmax's big brother; there's dozens of them! From experience we can tell you that the average technical book weighs in at around 250,000 words in total. There's only 1% of that here, so obviously we'll be skipping over some details. Don't panic – you won't be left high and dry.

In order to get anything out of this article, you must have gmax installed, and you should also have worked through the tutorials. Last issue's Cover CD included not only the new version of gmax, but also full documentation and tutorials, so there's no excuse if you haven't used either of them yet! The tutorials that come with gmax are crystal clear, quick to work through, and generally quite good fun, so don't be afraid to use them.

You'll also need to have installed the FS2002 gmax plug-in, something that we covered in the last article. Microsoft has, however, released a patch for a small program called MakeMDL that comes with FS2002. You'll need the patch installed as well, so take a look at the 'Installing the MakeMDL fix' boxout before going any further. We're not going to do much drawing here either – we'll leave you creative types out there to experiment on your own. This article focuses squarely on how to transfer work created in gmax into FS2002.

Installing the MakeMDL fix

On this month's Cover CD you'll find, courtesy of Microsoft, a file called gmax_scenery_tutorial.exe. Run it and it will install a fantastic scenery building walkthrough in C:\FSSDK on your hard disk. If you take a look at this directory you'll find a program called MakeMDL.exe. Copy this to your C:\gmax\PlugIns directory and overwrite the program of the same name already there. This will fix a number of rather annoying bugs with Microsoft's MakeMDL program – bugs that cause untold problems when building planes and scenery in gmax.

Aircraft designers beware!

If designing aircraft is the reason for your interest in gmax, then it's worth taking a long hard look at the models in the gmax aircraft samples directory of FS2002. In particular, take a look at the names assigned to each and every component of those models in the gmax object browser. FS2002 expects to see those names in order to identify which parts to animate, where lights should go, and so on. You need to name your flaps, ailerons, rudders, wheels and so on the same as those in the sample images if you want FS2002 to identify them correctly.

Aircraft

As far as FS2002 is concerned, gmax is great for two things – building planes and building scenery. Since planes are far more fun than buildings, we'll start with them, and get you to build your very own, completely flyable, MD-83 commercial jet, and in less than 15 minutes. You don't see that kind of thing on Blue Peter, do you?

Fire up gmax and press [CTRL] and [O] together; this is the same as clicking Open on the File menu, but much faster. Use the file dialogue to navigate to your FS2002 gmax directory (this is not the directory where gmax is installed, but FS2002's own gmax directory). Typically this lives at C:\Program Files\Microsoft Games\FS2002\Gmax. You'll find a directory in there called Samples, so open that, then the Aircraft directory, and then the MD_83 directory. Double-click on the file called MD_83 to load the aircraft into gmax. We're assuming that you've already drawn the plane you want to use yourself, and are using a dummy plane from Microsoft to serve as an example. Gmax should now look like Figure 1. Before going any further, you'll need to change the unit of measurement; whoever drew this particular aircraft (attractive though it may be) used inches as the unit of measurement. If you were to put this plane into FS2002 as it is, you'd have an MD-83 about the size of a Cessna's front wheel.

Click on the Customize menu in gmax and select the Preferences menu item. A dialogue will appear just like in Figure 2. At the top left of the window you'll see the unit of measurement set to inches. Change it to metres. Underneath is a checkbox that reads Automatic Unit Conversion. Make absolutely certain that this is checked (turned on) and then click on the OK button to return to the gmax editor. Now you're ready to go. You've spent hours building a model of the aircraft of your dreams, and the time has come to make it fly.

Click on the File menu and choose Export. (If you haven't installed the FS2002 gamepacks, as shown in the last article, you won't be able to click on the Export menu and can't proceed any further.) A file dialogue will appear; make sure it's pointing at the c:\gmax\gamepacks\FlightSim directory. Key in MD_83 as the file name, and change the file type at the bottom of the dialogue to FlightSim MDL file, as shown in Figure 3, then click on Save. This will fire up the MakeMDL application that will convert the gmax aircraft into a flight sim model. Some people advocate getting gmax to export the aircraft straight into the FS2002 directory – if you are using NT4 or Windows XP, though, this won't work.

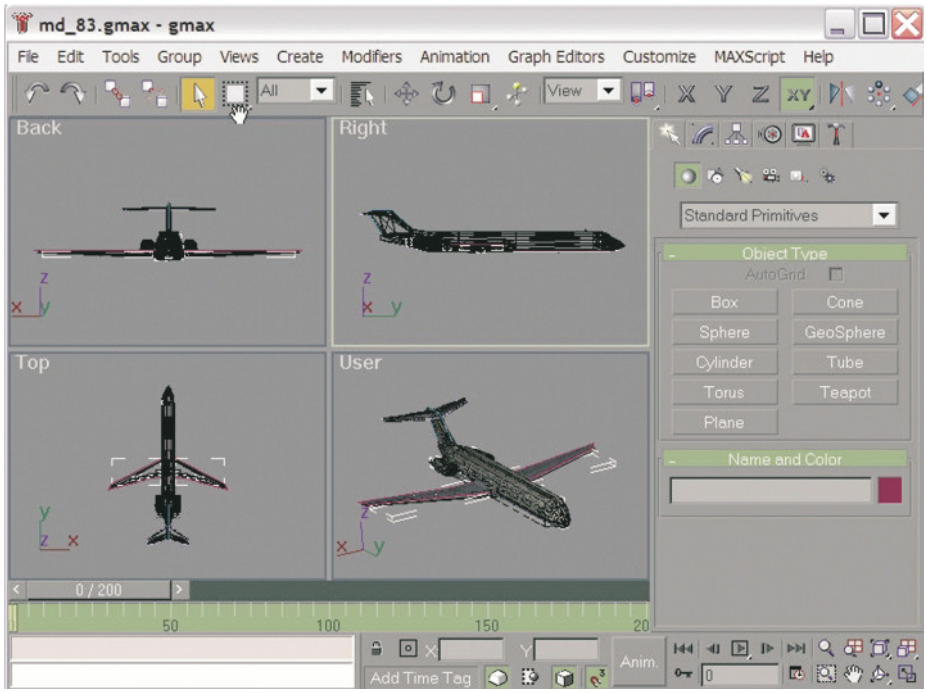


Figure 1

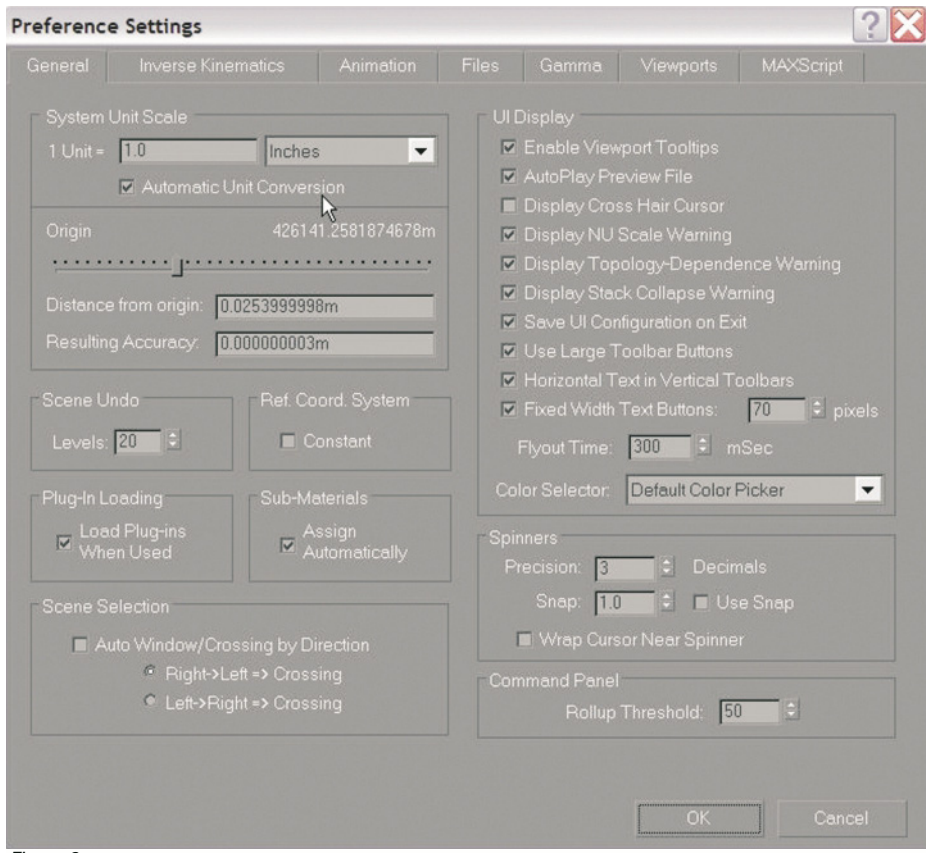


Figure 2

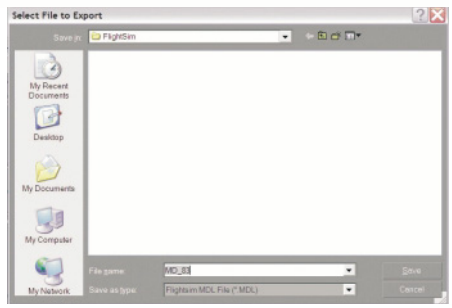


Figure 3

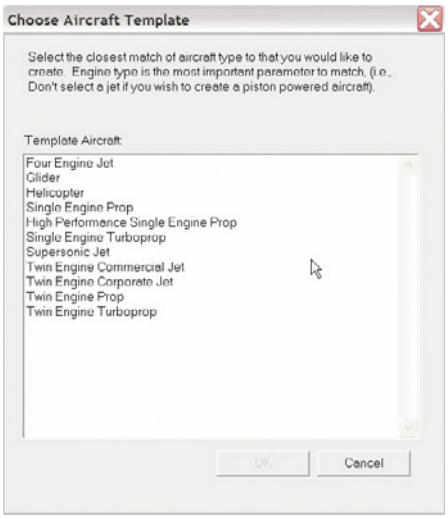

Choose Aircraft Template
Select the closest match of aircraft type to that you would like to create. Engine type is the most important parameter to match. (i.e., Don't select a jet if you wish to create a piston powered aircraft).
Template Aircraft:
Four Engine Jet
Glider
Helicopter
Single Engine Prop
High Performance Single Engine Prop
Single Engine Turboprop
Supersonic Jet
Twin Engine Commercial Jet
Twin Engine Corporate Jet
Twin Engine Prop
Twin Engine Turboprop
OK
Cancel

Figure 4

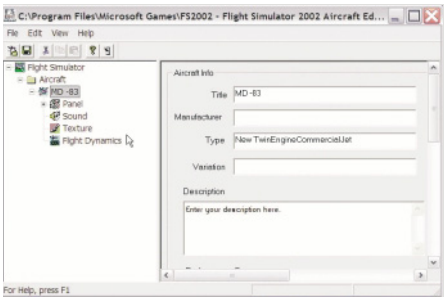


Figure 5

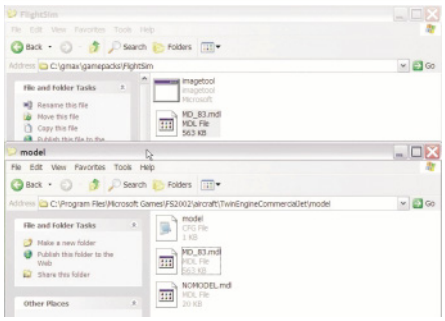


Figure 6

To get the plane into FS2002 you'll need to first fire up the Aircraft Editor. You can find this on the Start menu in Windows in the same place as FS2002 itself. When the Aircraft Editor is running, click on its File menu and choose New. Figure 4 will appear. This window lets you choose the type of plane you want, so choose 'Twin Engine Commercial Jet' from the list and click OK. You'll then be asked to name your aircraft – MD_83 is a good bet. Finally, you'll be told that you can find your new plane at C:\Program Files\Microsoft Games\FS2002\Aircraft\TwinEngineCommercialJet. Click on OK.

The FS2002 aircraft entry is now almost complete. If you are an aerodynamics graduate with a firm understanding of the relevant aerodynamics and physics, feel free to wander through the entries in Figure 5 and tinker with the flight model. Then join the rest of us by clicking File, then Save, and then closing down the Aircraft Editor. Now copy the MD_83.mdl file you created earlier from C:\gmax\gamepacks\FlightSim into the Model directory of your aircraft, as in Figure 6. When you've done that, use Notepad to edit the Model file in that directory so that it looks like this:

[models]

normal=MD_83.mdl

Now you can go flying. Load up FS2002, choose the UnspecifiedTwinEngineCommercialJet as the aircraft you want to fly, and away you go. You will notice of course that the aircraft needs painting (see Figure 7), but full instructions on how to do this can be found in the tutorials.

Figure 7. We'll let your imagination take care of this

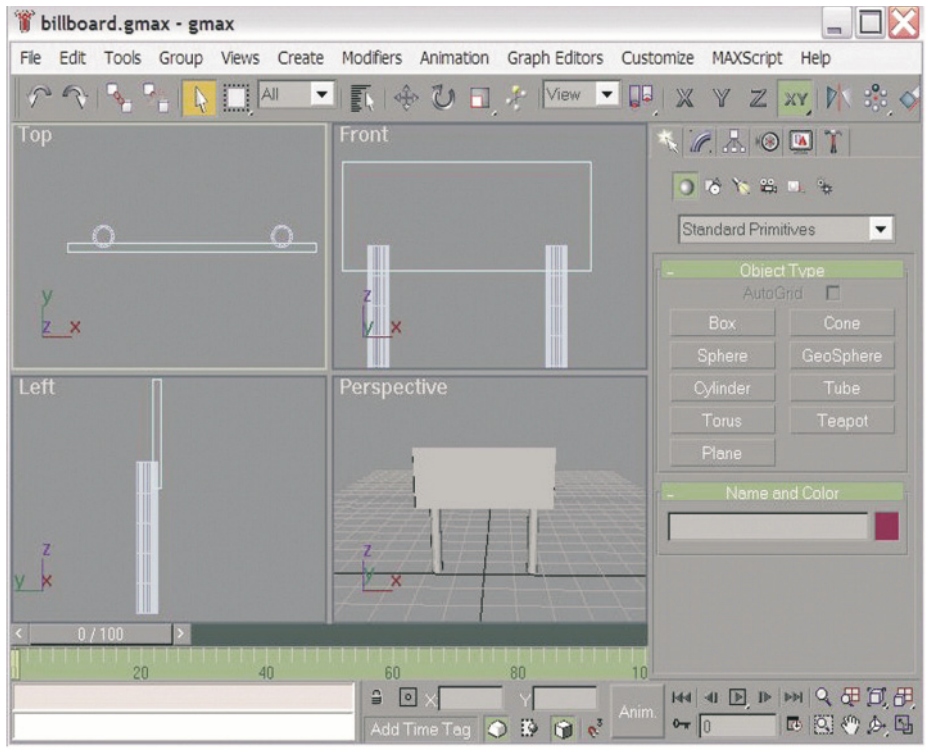


Figure 8

Buildings

Let's assume that PC Pilot decided that the best form of advertising would be a 200-metre-wide advertising billboard just to the left of Runway 8R at Gatwick. Let's update FS2002's scenery to take this into account. First, you are going to need your own scenery directory; create a 'C:My Scenery' directory on your hard disk, and inside it create a SCENERY directory and a TEXTURE directory, then start gmax. Make sure the unit of measurement is still set to metres, and if it's not, change it.

Building the billboard is quite easy. You just need to create two tubes and a box, as in Figure 8. It's easiest to do this in the Top

Finding the right building site

Just how can you find out where would be a good spot to place your new buildings? Run FS2002 and put your aircraft on the ground at a nearby airport. Press [Y] to enter slew mode, and then use your joystick to move the aircraft around. As you do so, FS2002 will display the latitude and longitude of the aircraft at the bottom left of the screen. When you find the right spot, make a note of the coordinates ready to enter them into MakeMDL.

view (refer to the tutorials for information on how to draw tubes and boxes). Now we need to texture them. Click on the Edit menu and choose Select All, and then click on the Materials Editor on the toolbar (Figure 9). This will load up the Material Editor window shown in Figure 10.

Figure 9

Click the 'new' button, and then click on the Open File icon (the button just under the letter D of Diffuse Map). You'll find a bitmap file on the Cover CD called billboard.bmp. This is a 256x256 bitmap, which is just the right size for use in gmax. Select it. The texture will be applied to everything you've drawn so far. Save your diagram at this point.

Now we need to export the billboard into FS2002. Just as before, click on the File menu and choose Export. Fill in the dialogue just like in Figure 11. Make sure you are

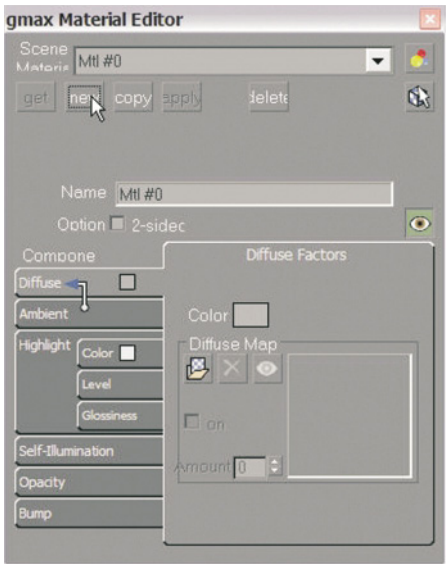


Figure 10

saving a BGL file this time around, and that you are saving it to the SCENERY directory of the My Scenery folder you created a little while ago, and then click Save.

You'll now be asked to enter the latitude and longtitude of where in FS2002 the object should go. Enter N 51° 9.48' W 0° 13.28', which is just to the left of runway 8 Right at Gatwick (see 'Finding the right building site' for some insight into how to find this out), and then click Start. The exporter will work its magic, and when it's done close down gmax.

By default, gmax won't export the textures you've used, only references to them, so you'll need to build the texture file now. If you look in your C:\gmax\Gamepacks\

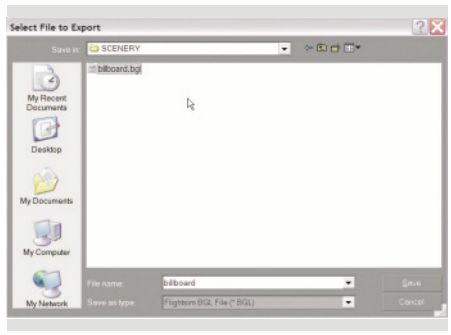


Figure 11

FlightSim directory you'll see a tool called Image Tool. Run it. Click on File, then Open and load in the billboard.bmp image we used. Then, click on the Image menu, Select Format and choose DXT-1 as the compression to use (this is what FS2002 wants to see). Finally, choose Image once again, and then pick Create MipMaps. Your image will now look like Figure 12. Click on the File menu, choose Save As and save the new image to the TEXTURE directory in your My Scenery folder.

All that remains is to tell FS2002 that it has new scenery to deal with. Run FS2002, and at the welcome page choose Settings, then Scenery Library. You'll see the list of scenery that FS2002 knows about. Click the Add button and choose your My Scenery folder in the file dialogue that pops up. When you're done, click OK. Now load up a flight at Gatwick runway 8 Right and take a look to the left – you'll see the billboard pictured at the top of this article, right where it would be in real life. ■

Peter Wright

Want even more out of gmax?

It's not actually that hard to add planes or scenery to FS2002; the tricky bit is producing the models in the first place. There are countless things that you can get gmax to do in conjunction with FS2002, such as building undercarriages with suspension, adding lights to aircraft, and creating opening doors and cargo bays. In fact there's nothing stopping you from building stealth aircraft complete with hidden weapons bays that can be opened and closed in flight. However, this takes quite an intimate level of knowledge of both gmax and the FS2002 Aircraft Editor.

As a start, the gmax_scenery_tutorial.exe file on the Cover CD provides a fantastic walkthrough of how to add a building to FS2002 which has different textures at night and during the day.

To learn more, take a look at zone.msn.com/flightsim/default.asp and click on the Developer Desk link. There you'll find examples, walkthroughs and even more utilities to help you out. Alternatively take a look at www.simviation.com, www.freeflightdesign.com and www.windowlight.co.nz/ontarget/gmax.html for even more tutorials and help, as well as links to popular gmax/FS2002 message boards on the net.

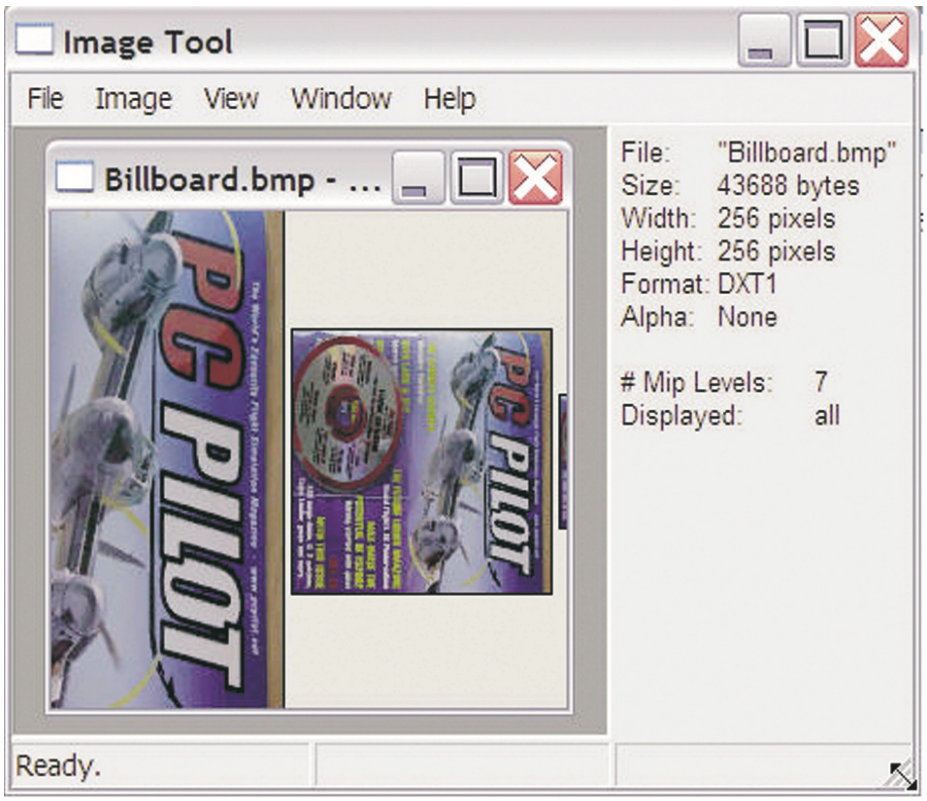


Figure 12

Flight Sim Training

Professional instruction with Bill Stack

The charts used in these tutorials have been specially supplied and reproduced with kind permission of Jeppesen GmbH. These charts are NOT to be used for real-world navigation. They are for information ONLY. © 2002 Jeppesen GmbH.

INSTRUMENT RULES IN VISUAL WEATHER

As our tutorials progress, we are applying instrument skills covered in earlier tutorials to increasingly interesting places and unusual situations. In this tutorial, we will combine visual flying skills with instrument skills to provide another unique challenge.

In this USA flight, we'll fly over the New York City area in weather good enough for visual flight. But because we'll be flying in Class B airspace, we will fly under IFR (Instrument Flight Rules) and under strict ATC (Air Traffic Control). We will see plenty of fine scenery, even though we are adhering to instrument rules.

Our 50-mile flight from Bridgeport, Connecticut (KBDR), to Linden, New Jersey (KLDJ), will take us north and west of the city, and will last about 30 minutes from take-off to landing.

Bridgeport is a small but busy commercial airport on the southern coast of Connecticut; it has some commercial traffic and a lot of business and recreational traffic. Linden is a small municipal airport within the southwestern quadrant of the New York City metropolitan area.

The New York City Class B airspace is among the world's more congested airspaces. It has three of the United States' busier commercial airports plus several smaller airports that are busy in their own right with commercial and GA traffic. Additionally, it has several military bases, numerous helicopter pads, and a few seaplane bases.

Don't take this short flight for granted. You will be kept very busy in this congested airspace, and each task will follow another in quick succession. Any failure or delay of execution will result in your going off course, being at the wrong altitude, and/or arriving at Linden in the wrong position and at the wrong altitude.

Don't take little Linden for granted, either. Real-world pilots say it's a scary place to land because the dense urban area makes seeing the airport difficult, the 800-foot VFR ceiling is abnormally low, and air traffic congestion at nearby Newark International (KEWR) is an ever-present concern and distraction.

For all its brevity, this flight will be challenging, fun and rewarding.

BEFORE YOU START

A few prudent practices that professionals normally apply can make your flights as realistic as possible. The background will also help you enjoy flying while you learn.

SELECT YOUR AIRCRAFT

Real-world pilots have few, if any, choices in the aircraft they fly. Most general-aviation pilots fly the one aircraft they own. The majority of pilots are rated to fly one aircraft, and only a few pilots are rated to fly two or three. Being free of these physical and legal restrictions, we flight simmers may 'fly' any aircraft available to us in our simulator.

The Mooney Bravo is a suitable aircraft for our tutorials, because it is an easy and fun plane to fly, and it gets us to our destinations fairly quickly. In the Bravo, this 90-mile flight will take about 40 minutes. The IFR version is required, because you will need the ADF that is absent in the VFR version. You're welcome to fly this route in another aircraft type after flying it with us in the Bravo.

THE CHARTS

Be sure to familiarise yourself with the Jeppesen charts we will use for this tutorial before embarking on the flight. They show the flight path, fixes and navigation aids, and are fully explained in the main tutorial. As well as the charts reproduced from the Jeppesen SIMCharts program that you'll see in this tutorial, we've included high resolution images of the charts on the cover CD. For more information see page 8.

PROFESSIONAL FLIGHT PRACTICES

As usual, we steadfastly emphasise the need for following prudent aviation practices. Applying them or not can make the difference between a successful or a failed flight.

USE FLIGHT PLANS

Flight plans are required for instrument flight, so we always recommend using them for the most realistic flight simulations. You are free to use paper plans or an electronic flight planner. Paper plans are a bit clumsy to make but easier to use aloft. Electronic plans are easy to make, but using them aloft requires following submenus that disrupt the simulation.

In lieu of filing your flight plan with ATC as real pilots do, imagine that you have filed in accordance with regulations. Keep your flight plan handy throughout the flight so you can easily refer to it. After your flight, file it in a folder or loose-leaf notebook.

NOTE THE TIME

We always jot down the time of significant events during our flights, and we recommend your doing this too. Note the time of take-off, the time of passing significant fixes and navaids, and the time of arriving at the destination airport's airspace. Recording your times and tracking your progress help make the flight more interesting and come in very handy at the destination airport.

COMPENSATE FOR WIND

Be sure to account for winds in your plan, because deviations from your desired course will consume additional fuel and delay your arrival. Our tutorial in Issue 4 explains wind compensation in detail.

MONITOR YOUR PROGRESS AND STATUS

Throughout your flight, check your instruments for the status of your aircraft and engine. Check your position frequently, and also radio navaids, time/speed/heading and/or GPS. Monitor your engine-temperature, oil-pressure, fuel-flow and fuel-supply gauges. Correct as necessary to maintain the desired course, altitude and performance levels. At the end of the flight, compare your estimates to the actual performance in time and fuel consumption.

SIMULATE AIR TRAFFIC CONTROL

Unfortunately, the IFR ATC feature in FS2002 is of marginal use. This otherwise good simulation feature insisted that we take off from a runway we didn't want, then vectored us directly toward KLDJ instead of towards TEB, as filed in our IFR flight plan. Not complying resulted in ATC repeatedly barking these incorrect commands, culminating in termination of our IFR flight plan. These faults occurred every time we flew this route, and we were unable to work around this problem or find any fix for it. For this tutorial, consequently, we used FS2002's VFR guidance while adhering to IFR procedures.

FLY ONE STEP AT A TIME

While leaping over the basics and plunging into advanced flights is a great luxury of flight simulation, it is not realistic. Real pilots do not start at the end of the training course and work backwards, because it deprives them of the skills needed for meeting subsequent challenges. When flight simmers try to meet challenges for which they are unprepared, they frustrate themselves with poor performance and errors. So we strongly advise doing everything one step at a time and building your skills toward the next levels, just as real pilots do. Pause your sim at any time you consider it necessary, as you will not have a certified flight instructor in your cockpit to help you.

USE THESE TUTORIALS FOR FLIGHT SIMMING ONLY

These tutorials are intended for computer flight simulation, not for real-world aviation or real-world flight training. While making our tutorials as realistic as possible, we have adapted them out of necessity to the limits and nuances of flight simulation, so some aspects cannot and do not apply to real-world flight. Therefore we caution everyone to use these tutorials for their intended purposes, and we accept no liability for anybody's misuse of them.

OUR AUTHORS

Bill Stack is an expert flight simmer and author of several popular flight sim books. Nels Anderson, our technical consultant, is a certified pilot and president of FlightSim.com. Learn more about flying like a real pilot from Bill Stack's five flight sim books at www.topskills.com/flitsim.htm.

REFER TO OUR PRIOR TUTORIALS

If you don't have our previous tutorials, they are all available either in back issues or on our 3-in-1 CDs. A complete list of the subjects covered in previous tutorials is included on the Cover CD. For more details of back issues and the issues available on CD format, see our subscriptions page or the website, www.pcpilot.net. Is there anything else you would like to see covered in our tutorials?

FLIGHT SETUP

Prepare your simulator for your flight. It takes only a few minutes, and it makes your flight more challenging, more realistic and more fun.

GET YOUR WEATHER BRIEFING

Every VFR and IFR pilot needs to know the weather conditions at origin and destination airports as well as en route. Weather in mountainous regions can vary dramatically from place to place and from moment to moment. Your weather briefing is available from three sources: 1) the weather settings listed in this tutorial, 2) the weather menu you used for establishing the weather for this tutorial, and 3) the ATIS (Automatic Terminal Information System) message at the airports.

For this tutorial we will set weather clear enough for visual flight so we can experience instrument rules in visual weather conditions.

When we began writing this tutorial in May 2002, spring and summer were clashing in the northeastern United States. People were enjoying summery weather on some days and spring chills on others, separated by violent cold fronts. Today, however, the entire area is blessed with warm sunshine and light southwesterly winds that will make our flight delightful.

Global Weather

Use 'Global weather'

Clouds:	Cumulus, 2/8, Ceiling 8,000 MSL, Top 12,000 MSL
Deviation:	zero
Turbulence:	none
Icing:	none
Precipitation:	none
Wind up to 3,000 MSL:	04 knots from 235 degrees
Wind up to 6,000 MSL:	08 knots from 240 degrees
Wind up to 9,000 MSL:	12 knots from 245 degrees
Temperature, dew point up to 3,000 MSL:	70°F/21°C, 45°F/07°C
Temperature, dew point up to 6,000 MSL:	55°F/13°C, 30°F/-01°C
Temperature, dew point up to 9,000 MSL:	40°F/04°C, 15°F/-09°C
Pressure:	30.23 inches, 1024 millibars
Visibility:	20 miles, 32 kilometres

Weather at Linden (KLDJ)

Use 'Local weather' for Newark (KEWR)

Clouds:	Cumulus, 1/8, Ceiling 8,000 MSL, Top 12,000 MSL
Deviation:	zero
Turbulence:	none
Icing:	none
Precipitation:	none
Wind up to 3,000:	04 knots from 245 degrees
Wind up to 6,000:	08 knots from 250 degrees
Wind up to 9,000:	12 knots from 255 degrees
Temperature, dew point up to 3,000 MSL:	72°F/22°C, 47°F/08°C
Temperature, dew point up to 6,000 MSL:	57°F/14°C, 32°F/00°C
Temperature, dew point up to 9,000 MSL:	42°F/06°C, 17°F/-08°C
Pressure:	30.03 inches, 1017 millibars
Visibility:	20 miles, 32 kilometres

Flying this tutorial during daylight or at night is your choice, because there is no practical difference for instrument flights. Actually, flying over the New York City area at night can be spectacular. To fly at night, refer to our Issue 6 tutorial for details of night flying. To make the flight a little more interesting, try taking off before dusk or dawn so light conditions will change en route.

PREPARE YOUR AIRCRAFT

Be sure to prepare your aircraft for flight before taking off by setting your radios and gauges and turning on your lights. The following conditions generally apply to most flights.

POSITION YOUR AIRCRAFT

Two factors must be considered in selecting which runway to use. Because the wind at KBDR is from 235, the best runway for taking off from would be 24. But ATC in FS2002 insists on making us take off from runway 29, so we'll play along and use it against our better judgment. Fortunately, the winds are mild, so the impact will be minimal. Therefore, start your flight at the take-off point of runway 29.

CALCULATE THE FUEL NEEDED

Calculate your fuel needs and carry enough for this trip, using the aircraft's average fuel-flow rate plus legal requirements to determine the amount of fuel required. Remember that our Mooney Bravo uses about 16.5 gallons of fuel per hour from take-off to landing and we must include enough to reach an alternate airport and remain aloft for an additional 45 minutes. Our estimate for today's flight is more than 25 gallons and less than 35 gallons. What is your estimate?

SET UP YOUR AIRCRAFT

'Buy' enough fuel based on your fuel calculations. Your fuel mixture should be rich, and your propeller pitch should be low at these low altitudes. The cowl flaps should be fully open while on the ground and during take-off and climbout. The carburettor heat should be off, because it is not needed and its use will reduce performance when the best is needed. The pitot heat won't be needed unless the temperatures are below freezing and there's moisture in the air.

TUNE YOUR RADIOS

Although you can rely on your GPS for navigation, you still need your conventional radio navaids for airport operations, and as a backup during the en route portions. Set your Nav-1 and Nav-2 radios and your OBI for the first frequencies and radials you will use.

SET YOUR GPS

Engage your GPS by displaying it on your screen, then check the displayed course to be sure it reflects your desired flight path. Don't worry about SIDs, STARs or IAPs, because the FS2002 GPS does not reflect them. Set the map for 'north up', 'course up' or 'track up', whichever you prefer.

As usual, pilots should know how to use the GPS devices in their simulators; that is, how to engage the devices, change view screens, select data and so forth. Read your manual for instructions.

SET YOUR GAUGES

As standard procedure, set your altimeter for local barometric pressure.

TURN ON YOUR LIGHTS

Turn on the lights appropriate for this flight. Nothing is wrong with using the position lights and strobes during daylight operations, even though they are required only for night flights. Strobes are required at night except when their reflections from clouds would present a safety hazard to the pilot. Landing lights are recommended for taking off, landing and whenever flying below 10,000 feet (3,050m) above MSL (Mean Sea Level).

PREPARATION CHECKLIST

(This checklist is for these tutorials only, and is not intended to be complete.)

Aircraft Settings

Engine:	running
Fuel supply:	adequate
Fuel mixture:	richest
Propeller pitch:	highest
Cowl flaps:	open fully
Wing flaps:	10 degrees (specified by Mooney)
Carburettor heat:	off
Pitot heat:	as needed
Rudder:	straight
Ailerons:	neutral
Elevator trim:	neutral

Gauges

Altimeter:	local pressure
Amperes:	neutral
Vacuum:	green
Oil pressure:	green
Fuel pressure:	24 psi (specified by Mooney)

Radios

Com-1:	121.9 (Bridgeport Ground)
Com-2:	not needed
Nav-1 Primary:	108.4 (Teterboro TEB)
Nav-1 Standby:	108.4 (Teterboro TEB)
Nav-2 Primary:	108.8 (Bridgeport BDR)
Nav-2 Standby:	108.4 (Teterboro TEB)
OBI-1:	079/259
OBI-2:	070/259
ADF:	254 (Chatham CAT)

GPS

Map view:	ON
Orientation:	as desired
Zoom level:	as appropriate
Plotted course:	as filed
Displayed:	as needed

Lights

Beacon:	ON
Strobe:	ON
Position (navigation):	ON
Landing:	ON
Taxi:	ON

Clock

Local time or your choice

Simulator

Aircraft runs out of fuel

Make a Flight

After you've set up your aircraft, make a flight so you can bypass all these efforts on repeat flights of this tutorial. Name your flight 'Bridgeport KBDR 29 TO Bravo'. In the description box, enter 'Taking off from runway 29 at Bridgeport KBDR, Connecticut USA for Linden KLDJ, New Jersey USA in the Mooney Bravo for PC Pilot Tutorial 18'.

IFR (Instrument Flight Rules) Tutorial Part 18

Instrument Rules in Visual Conditions

Before you begin your flight from Bridgeport (KBDR) to Linden (KLDJ), prepare your simulator and aircraft in accordance with the previous instructions. Then position your aircraft and review your charts.

YOUR FLIGHT CHARTS

Procedures for today's flight are shown on the respective charts.

Airport

With today's southwesterly winds, KBDR's runway 24 is ideal for our take-off, but FS2002's ATC persistently instructs us to use runway 29. With the wind at only 4 knots, runway choice makes little difference, and 29 would probably be the active runway at KBDR anyway. So we'll use 29 instead of 24.

Departure

The KBDR departure chart shows a lot of data but no prescribed route from the airport. The text states that departures are "via vectors to assigned route/fix", and "expect clearance to filed altitude/flight level 10 minutes after departure". These statements mean that ATC guides aircraft from KBDR's airspace based on existing weather and traffic conditions. Therefore we will follow FS2002's ATC departure guidance from the area. Simmers without this guidance should follow our flight plan as filed.

En route

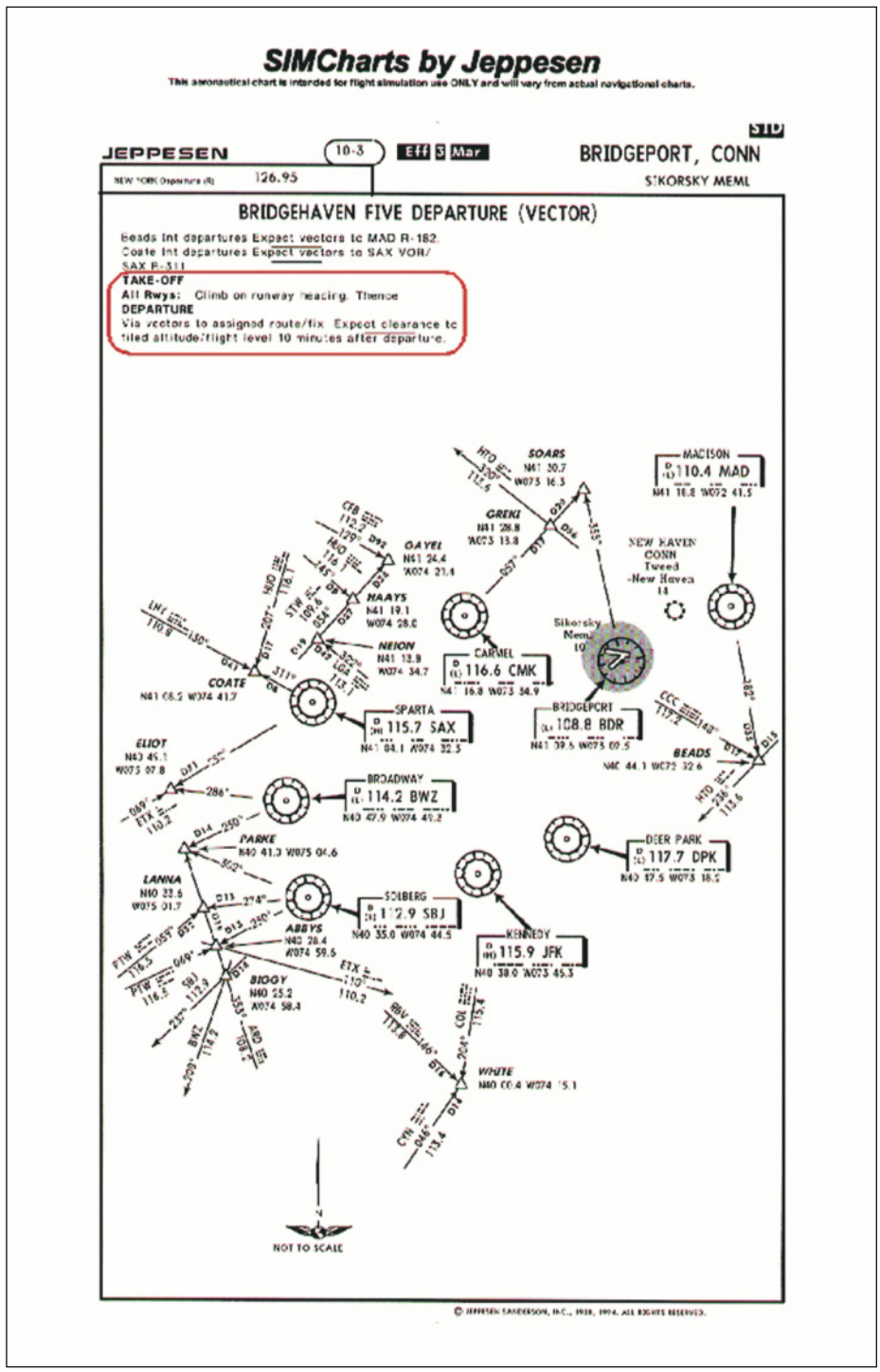
Neither the IFR en route chart nor the VFR sectional chart show any prescribed airways directly from KBDR to KLDJ. Because the KLDJ approach chart leads aircraft from TEB, we will fly westward to TEB, then turn left and fly southwestward toward KLDJ. We will cruise at 6,000, because IFR flights heading west in the United States must use even altitudes, and 6,000 is plenty high enough for this short flight.

Arrival/Approach

No arrival procedure is available for KLDJ, but the two approach procedures provide enough guidance to lead aircraft to the airport. Both procedures are circling approaches, which we explained in Tutorial 16 at Rotterdam, Holland. The common terms 'circling approach', 'circle-to-land approach' and 'circle-to-land manoeuvre' refer to the same flight procedure. Minimum altitudes are shown in the charts' lower right corners.

The procedure for approaches from the north starts at SOAKI intersection. This fix is at the intersection of the 222 radial from TEB and the 317 radial from Canarsie VOR (CRI), and it is 7 miles from TEB along its 222 radial. When we head 222 from TEB, we will arrive at SOAKI when we intersect the 317 radial from CRI and when we are 7 miles from TEB. The chart also shows an entry altitude of 2,200 MSL. This means we must be at 2,200 when we arrive at SOAKI, not that we should begin descending to 2,200 at that point.

From SOAKI, we maintain our heading and altitude until we reach DAYNL. This fix is at the intersection of TEB's 222 radial and CRI's 297 radial, and it is 12 miles from TEB along its 222 radial. Furthermore, DAYNL is 3.9 miles from KLDJ. This 3.9-mile distance to the airport is deduced from the difference between D15.9 and D12.0 on the plan view, and it is clearly shown on the profile view.



Bridgeport (KBDR) SID

At DAYNL, we begin our descent towards the airport while continuing our 222 heading. From DAYNL, we follow a circling-approach procedure.

Circling-approach procedures allow pilots to land in one of four patterns. Option A allows landing on the intended runway if the approach path is within 90 degrees of the runway centreline and the pilot sees the runway in time to establish a base leg. This pattern works for this northerly arrival.

We must not descend below the minimums shown on the circle-to-land table in the lower right corner of the chart until we are able and ready to land.

The two columns of circle-to-land minimums relate to the altimeter setting being used by the pilot at the time. Pilots use the local KLDJ barometric pressure when it is known, and they use the barometric pressure at nearby Newark International (KEWR) when KLDJ's pressure reading is not available. Because we know the pressure at KLDJ, we will use the minimums shown in the left column.

The four rows of circle-to-land minimums relate to the aircraft type and airspeed being used on the approach. Our Bravo is a Type A aircraft, and it will approach at about 90 knots. While the minimums are the same for all aircraft types and approach speeds, the visual ranges increase for faster approaches. The faster you are travelling, the more visibility is needed to perform this type of manoeuvre.

From this circle-to-land table we can see that our minimum descent altitude is 620 MSL. This means we may proceed with our landing only when we can see the runway from 620 MSL or higher. If we cannot see the runway, we must execute the missed approach from D15.9. In today's lovely spring weather there would be only one thing that could prevent us from seeing this runway – if we seriously botch the approach procedure.

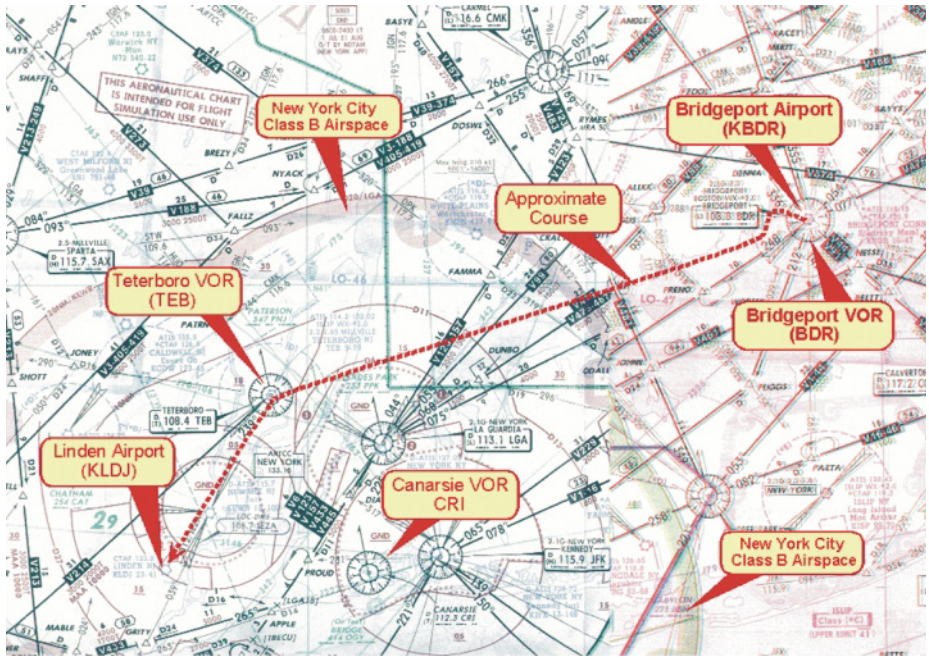
Missed approach

The missed-approach procedure at KLDJ is easy compared to others we've performed in prior tutorials. From the decision point, simply turn right, head toward Chatham VOR (CAT), climb to 2,000 MSL, and hold at CAT.

PLAN YOUR FLIGHT

Based on these charts, lay out the course you will fly from KBDR to KLDJ. Include the relevant navaids, intersections and fixes shown on these charts.

Use traditional paper charts and flight plans or Microsoft's electronic flight planner. Paper charts and flight plans are still useful for seeing our course and estimated times at a glance. The electronic flight planner works with the GPS. If you use GPS, the display will show the course you plotted. You might try the flight once with electronic flight planning and once without for the different experiences.



Bridgeport to Linden (KBDR-KLDJ) IFR chart

Enjoying the splendid New York scenery as the Mooney Bravo flies past

Enter the following data on your flight plan:

Departure: Bridgeport, Connecticut, USA (KBDR), runway 29

Arrival: Linden, New Jersey, USA (KLDJ)

Waypoint: Teterboro VOR (TEB)

Waypoint: SOAKI intersection

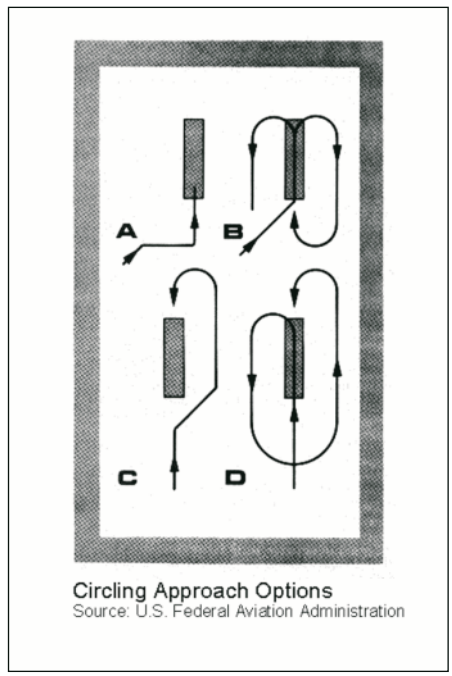
Waypoint: DAYNL intersection

Altitude: 6,000 feet (2,440m) MSL

Unfortunately, FS2002's electronic flight planner does not include SOAKI or DAYNL intersections, so ignore those fixes in that flight planner only. If you're using paper flight plans, enter those fixes. Be sure to fly to the fixes on your way from TEB to KLDJ regardless of what type of flight plan you're using.

BEGIN YOUR FLIGHT

After you have prepared your aircraft, your cockpit and yourself for this flight, contact KBDR ground control for take-off clearances. Follow ATC's instructions, including hand-offs and clearances. If you have no ATC in your sim, imagine that you have requested and received all required clearances.



Approved circling-approach procedures

Be sure your landing light is on, and keep it illuminated throughout this flight. Use of landing lights below 10,000 is recommended (though not required). You will be flying through very congested airspace populated with nearly every type of airworthy machine. All these pilots will benefit from the visual assistance.

TAKE OFF

Your take-off should begin as soon as ATC clearance is received. In lieu of ATC, set your transponder for 5213, which is the setting we received from ATC.

Check your engine instruments during your take-off roll. The Bravo's manifold pressure

New York City VFR chart

should be at or above 38, and the oil pressure should be at least 24. The Bravo should lift off at about 60 to 65 knots. (Different characteristics apply to other aircraft.) If your aircraft isn't performing normally, abort your take-off.

During take-off and climbout on this flight you will have a slight left crosswind that will push you gently towards your right.

Adjust your pitch to maintain about 85 knots during your climbout. As you are climbing, adjust your cowl flap to keep your engine temperature in the green range – neither too hot nor too cool.

After your initial climbout, your Bravo should be able to climb easily at 700 feet per minute and 120 knots. Retract your flaps when your airspeed reaches 90 knots.

Icing is not likely in this dry weather and at these moderate temperatures, so your de-icers and pitot heat will not be needed.

DEPART BRIDGEPORT

Without established departure routes and minimums, we must follow ATC vectors out of KBDR. Indeed, the chart says this very thing. Soon after taking off from runway 29, FS2002's ATC at KBDR handed us off to New York Approach.

To our dismay and frustration, however, New York Approach repeatedly vectored us 250 directly towards KLDJ instead of 259 towards TEB as shown on the filed flight plan. Flying directly to KLDJ would place us in an awkward position for joining the instrument approach procedure, so we cancelled IFR and requested flight following. If you can get ATC to follow your filed flight plan, use IFR ATC services. Otherwise, cancel your IFR ATC services, follow your IFR flight plan as filed, and use VFR flight following. Do not fly directly to KLDJ without first flying to TEB.

Regardless of whether FS2002's ATC is used, this flight remains IFR, so be sure to follow IFR procedures and ATC guidance from take-off to landing.

FLY EN ROUTE TOWARDS LINDEN

Our en route portion will consist of two rather short legs; the first will be a 46-mile leg to TEB. The second will be a 16-mile leg from TEB. We should reach our 6,000 MSL cruising altitude about nine minutes after taking off and about 15 miles west of KBDR. We should receive TEB on our Nav-1 radio about five minutes after taking off, and we should reach TEB about 20 minutes after taking off.

Be sure to adjust your fuel/air mixture as you climb to cruising altitude. The higher your engine gets, the less oxygen it will have for combustion, so you will need to decrease the fuel portion of the mixture to compensate. Our Bravo engine performs best when the TIT (Turbine Inlet Temperature) gauge reads between 1,600 and 1,700, so adjust the mixture so the TIT is within this range. Do not exceed 1,750. (Again, these performance readings do not apply to other aircraft.)

Conserve fuel by changing the propeller pitch at higher altitudes. Our Bravo cruised easily at 170 knots and used 15.50 gallons of fuel per hour with the following engine settings: RPM 2,100, manifold pressure 34, and TIT 1,600. If your engine is using fuel too fast, you could run out of fuel short of your destination. Adjust your settings until your airspeed and fuel-flow rates are optimised.

This en route leg provides plenty of good sightseeing; for more than half of it we will fly along the Connecticut coastline. You will see the coastline ahead of you, southern-Connecticut cities such as Norwalk, Stamford and Greenwich to your right, and Long Island Sound to your left. Long Island will be in the distance, beyond the Sound.

This half of this leg also provides an ideal opportunity to review the approach and missed-approach procedures at our destination. But be sure to pay attention to your progress and status, because you could easily pass important waypoints. In a few minutes, you'll be too busy to review charts and procedures.

About 20 miles to TEB, and about ten minutes into our flight, the coastline will curve southwards, and we will fly right over the Bronx. Westchester Airport will pass by your right window, and New York's buildings will appear straight ahead. Beyond the Bronx is the Hudson River, which separates New York from New Jersey.

When 15 miles to TEB, you will see the George Washington Bridge crossing the Hudson River ahead and to your left, and the Tappan Zee Bridge crossing this river out of your right window. A narrow river to your left separates the Bronx from Manhattan island, and the island's famous skyscrapers are visible in the distance. You might even spot the famous Yankee Stadium just north of this river. La Guardia airport is visible out of your left/front window when you are 13 miles to TEB. The clutter of New York skyscrapers will be clearly visible from your left/front window in approximately another minute.

This is a good point to be sure your Nav-2 standby frequency is tuned to TEB; you will be switching in a few minutes.

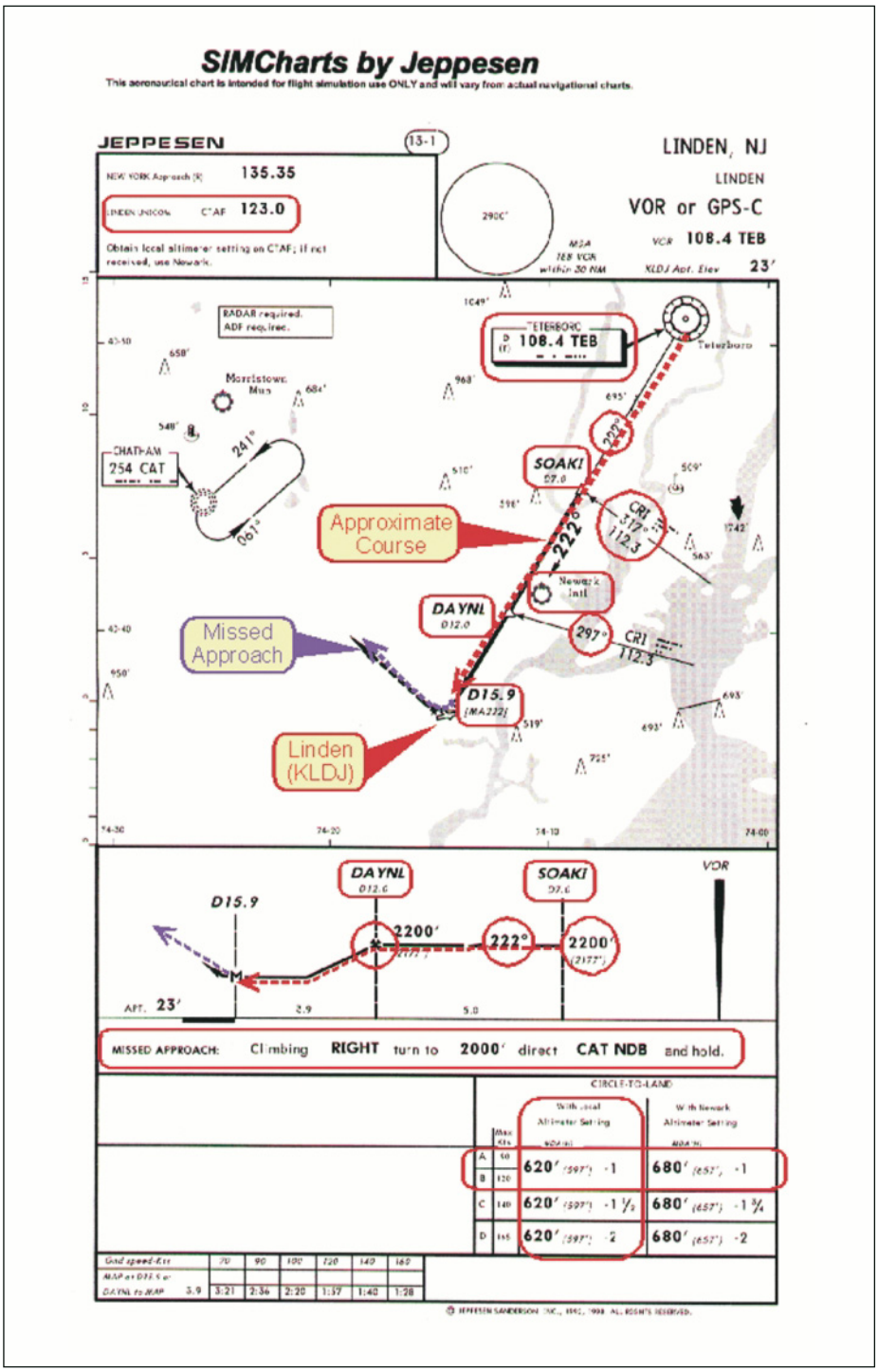
Next we'll fly over the Hudson River to New Jersey on the other side. Notice the George Washington Bridge crossing the river to your left. Teterboro Airport will be visible straight ahead as you fly over the Hudson. (We landed there in Tutorial 16.)

Don't be fooled by the excellent visibility or distracted by the splendid scenery. As you can tell from the frequent radio chatter, you are in very busy airspace, where instrument flight is common and air traffic control is mandated, so pay attention to your altitude, heading and track throughout this flight. Pay close attention also to that radio chatter, because some of it concerns you.

At two miles from TEB according to your DME, begin your left turn toward KLDJ. Actually, your position will be closer to one mile to TEB, but your being 6,000 feet above the VOR transmitter skews the DME reading in a phenomenon called 'slant range'. Then align yourself with TEB's 222 radial outbound. This course will lead you directly to KLDJ. Do not overfly TEB, because your turn will be too late.

Pause at any time during this procedure. You will not have a flight instructor or a co-pilot with you to help you perform all these manoeuvres properly in the required sequence and at the correct times.

As soon as you pass this fix, reduce airspeed and begin descending so you can reach the approach procedure at the correct airspeed and altitude. Change your OBI-1 needle to



Linden (KLDJ) approach

222 so you can strictly follow that radial outbound from TEB toward KLDJ. Change your Nav-2 radio to 112.3 for CRI, and change your OBI-2 needle to 317, which is the CRI intercept radial for the SOAKI fix.

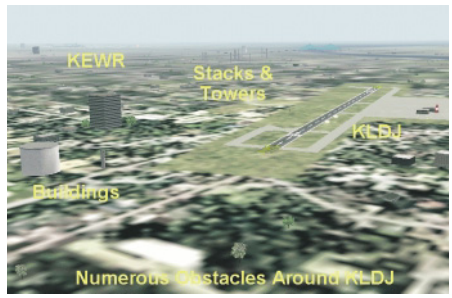
During your descent, readjust your fuel/air mixture and your propeller pitch, set your altimeter for local barometric pressure, and be sure your fuel is drawing from the fuller tank. Keep your airspeed below 120 knots during your descent.

Soon you will pass right over Giants Stadium (a landmark used on our approach to KTEB in Tutorial 16) but you won't see it unless you look through your Bravo's floor. The Hudson River, Manhattan island, and Manhattan's skyscrapers are all visible to your left on this leg, and KEWR will be straight ahead. You will fly right over it in a few minutes.

Seven miles from TEB on this 222 radial is SOAKI intersection, which is the IAF for our approach. You will reach it about 3.5 minutes after passing TEB.

JOIN THE LINDEN APPROACH

The chart shows two easy methods of determining your arrival at SOAKI. Both involve following TEB's 222 outbound radial. You will be at SOAKI when you are seven miles from TEB on its 222 radial and when you intersect the 317 radial of Canarsie VOR (CRI) on TEB's 222 radial.



There are numerous obstacles around Linden Airport

With the missed approach point being 15.9 miles from TEB, you will be 8.9 miles from KLDJ when you pass SOAKI. Accordingly, you will be about five minutes from the airport at this point, so you're almost there. When you reach SOAKI, reduce your airspeed to 110 knots and hold it through the approach procedure.

About two minutes after passing SOAKI, you will fly directly over KEWR. This is one of three Class B airports serving the New York City megalopolis. Flying through this busy airspace absolutely requires ATC clearance. Again, pay close attention to your course, altitude, heading and communication radio throughout this very busy airspace.

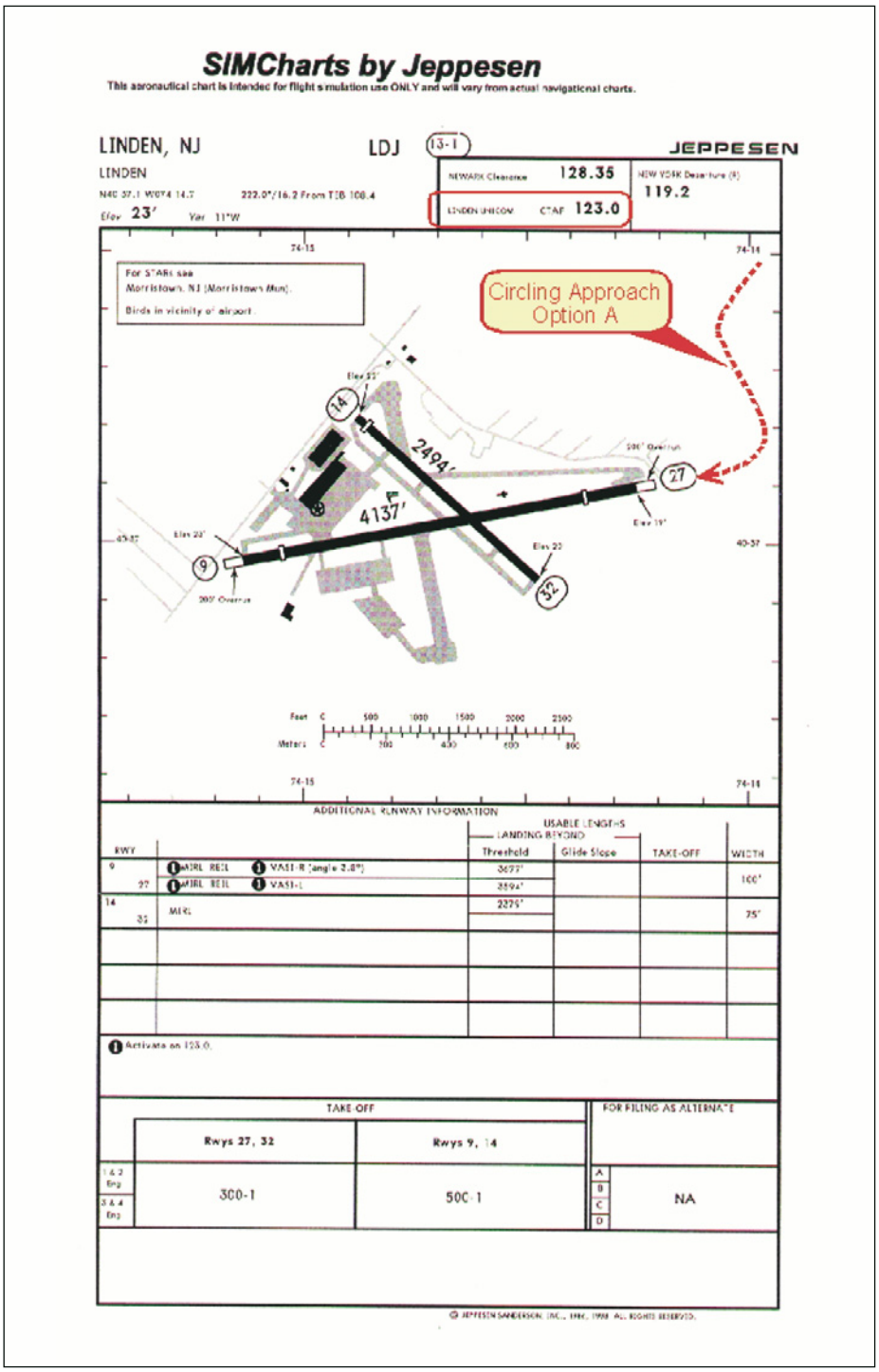
Just after passing KEWR, you will arrive at another important fix in this approach procedure. At DAYNL fix, which is 12 miles from TEB and at the intersection of CRI's 297 radial, begin descending toward the airport from your 2,200 MSL altitude. Switch your communication radio to 123.00 for the CTAF (Common Traffic Advisory Frequency), and announce your landing intentions. All aircraft using this airport should be tuned to this frequency, and they will hear your announcement. FS2002's ATC will offer you several options for this purpose. Select 'announce position'. Remember not to descend below the prescribed minimum of 620 MSL until you are ready to land, and stay below KEWR's 800 MSL shelf.

DO THE CIRCLING APPROACH

In this nice clear spring weather, we will see the runway in plenty of time for executing a right base leg. To do this, we need to turn left and head 180, which will be at a 90° angle to the centreline of runway 27 (consistent with Circling Approach A in the diagram). As you approach the centreline, turn right into your final approach and land as usual.

If you arrive at the airport too high or too fast for a safe landing, execute a standard left-turn traffic pattern around the airport, and position yourself for landing on 27.

Remember two crucial facts from our circling-approach tutorial: the pilot must keep the runway in view at all times, and also maintain the minimum prescribed altitude until proceeding with the landing.



Linden (KLDJ) airport diagram

You will see that the urban area around this airport is cluttered with buildings, towers, chimneys and other obstacles. Your 620 MSL altitude is unusually low for a circling approach, and it's uncomfortably close to the tops of these obstacles. For your safety, be absolutely sure you do not descend below this altitude or above the 800 MSL shelf of KEWR during your circling approach, especially during the turns. We can only imagine from our simulated flight the challenges real-world pilots encounter at the real Linden airport.

LAND AT LINDEN

The rest of this flight consists of a typical landing with a light headwind. Execute it normally, then clear the runway.

MISSED APPROACH OR GO-AROUND?

In the visual conditions we selected for this tutorial, a missed approach procedure does not apply. Pilots who cannot align a runway centreline for a safe landing under visual conditions execute go-arounds. If you have any problem aligning this runway for landing after executing the circling approach, fly over the runway and repeat the left-turn traffic pattern. Be sure to announce your intentions over CTAF.

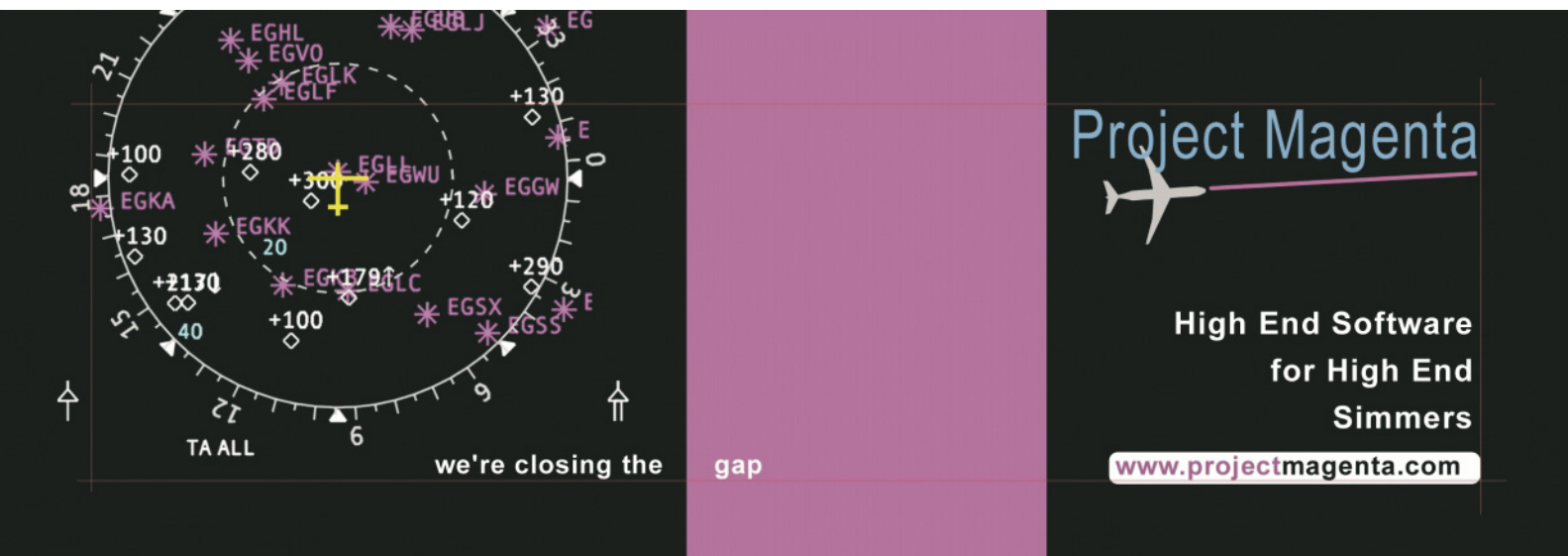
In instrument meteorological conditions, the missed approach procedure is required of pilots who cannot align for landing. It's comparatively simple at this airport; fly to CAT and join the holding pattern until cleared by ATC to repeat the instrument approach procedure.

CONGRATULATIONS!

You have successfully flown through one of the world's busier airspaces without getting in anybody else's way, and you performed a circling approach at an urban airport under unusual restrictions. Well done, indeed!

Keep flying this tutorial to build your proficiency. Apply stronger winds and turbulence and advance to more sophisticated aircraft to make it more challenging if you like. See you next time. ■

Bill Stack



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A Triple CH Products Selection

Similar – but different

Three new flight controllers from CH Products made their way to us recently – all of which are different, yet still possess obvious similarities. The Flightstick Pro, Fighterstick, and Combatstick 568, USB devices that promise to deliver the ultimate control in your favorite sim, are just three of the USB controllers offered by CH Products (www.chproducts.com). While these three each possess unique features setting them apart, they are obviously siblings, and share the following common features:

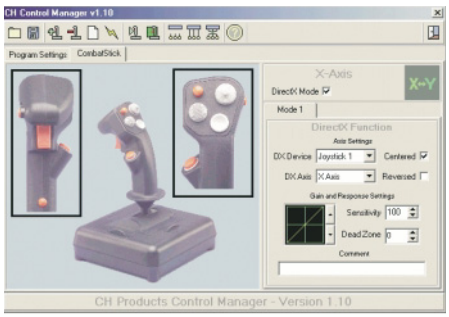
- Compatible with Windows 98, ME, 2000 and XP (requires DirectX 7.0a or above) for PCs, and Mac OS8.6 and above (requires Input Sprockets 1.7x) for Macintosh.
- USB interface
- Two-year limited warranty
- Side slide throttle wheel, dual rotary trim controls for ailerons and elevators
- Control Manager software for custom programming

Installation and configuration

USB continues to make installation of nearly any peripheral essentially effortless. All three sticks were instantly recognised and immediately functioning in the Game Controller section of the Control Panel in Windows ME. Yawningly simple, a quick calibration was the only move made before we were taxiing at our favourite airport. Programming the sticks within the simulation was the simplest, quickest way of configuring the buttons to our liking, while using the CH Control Manager offered multi-mode capability only to the Fighterstick (132 possible functions can be programmed into the Fighterstick this way).

Performance and ergonomics

Flying the C172 in FS2002, our initial rotation and subsequent traffic pattern manoeuvres yielded a somewhat 'lazy' aircraft. By reducing the null zone and increasing the sensitivity setting, the excellent response and control which the Skyhawk displays in real life were ours to enjoy. These settings also proved optimal for all other aircraft we tested, including the default 737-400 and Beech King Air 350. The throttle wheel was no less precise, as were the X- and Y-axis trim wheels, in making us believe we were highly skilled pilots.



Control Manager – simplicity itself

A unique feature (common to all three) is the aileron/elevator trim wheels, which are tied directly to the X/Y-axis of the stick; this means that, besides basic control surface movement through the stick, the wheels can further fine-tune the ailerons and elevators, additional to the default trim controls accessed through keys [1] and [7]. So what, you say? If you are experiencing

Flighterstick – programmable, but pricey

Fighterstick

We had high expectations for this expensive controller, but without Force Feedback or rudder input, what exactly do you get for your hard-earned cash? Nothing more, in fact, than a plethora of programmable buttons and a joystick that performs. A high price tag coupled with a rather incomplete product had us scratching our heads over this one.

Price: £124.95

- Three axes and 24 buttons (three push buttons, one mode switch button, three 4-way hat switches and one 8-way point-of-view hat)
- Total of 132 programmable functions
- Three separate programming modes accessed on the fly via mode switch on handle
- Coloured LEDs to indicate mode selection

Ergonomics: 4
Button placement: 4
Performance: 4
Installation and calibration: 5
Features: 3

Overall:

Flightstick Pro – ambidetrous grip, but throttle wheel position won't suit left-handers

X- and Y-axis resistance was smooth and clean, with the Flightstick being a bit softer than the Combat and Fighter versions. The hat switches, buttons, and wheels also performed with liquid precision throughout the week-long test period. As is common with CH Products equipment, moulded plastic is the prime ingredient in construction, including the base, stick, and buttons.

Perhaps the most glaring issue, if there is one, revolves around a particular absentee – the lack of any kind of rudder control. There is no built-in twisting action, nor a rocker switch that might control the Z-axis. This would seem to necessitate the purchase of a pair of USB pedals if combat is your flavour of flight simulation, or if you just demand rudder control in a realistic fashion. Flying combat using auto-rudder during tests in CFS2 quickly brought an end to our dogfighting.

any difficulty hand-flying approaches with a particular aircraft, these slick trim wheels just may bring a smile of satisfaction to your face. The extra fine-tuning provided just the right amount of additional control during approach on several test flights.

Flightstick Pro

The Flightstick is by far the most space- and cost-efficient of the lot. It boasts the smallest grip, fewest buttons, smallest base, and shortest height. CH markets the grip as ambidextrous, but with the throttle wheel residing on the left of the stick and unchangeable, we can hardly see this as being usable for left-handers. The simplicity, relative low cost, and fine performance give the Flightstick a high score for an entry-level, no-frills controller.

Price: £109.95

- Three axes and 12 buttons (four push buttons and one 8-way point-of-view hat)
- Total of 22 (66 with the Pro Throttle mode switch) programmable functions
- Grip designed for both left- and right-handed operation

Ergonomics: 4
Button placement: 4
Performance: 4
Installation and calibration: 5
Features: 2

Overall:

Combatstick 568

Betwixt and between might best describe the Combatstick. It's essentially a Fighterstick without the triple mode feature and two hat switches, costing about 25% less. The F-16-style grip is identical to that of the higher-priced unit, so this may be the best value in the group.

Price: £104.95

- Three axes and 18 buttons (six push buttons, one 4-way hat switch, and one 8-way point-of-view hat)
- Total of 34 (102 with Pro Throttle mode switch) programmable functions

Ergonomics: 4
Button placement: 4
Performance: 4
Installation and calibration: 5
Features: 3

Overall :

Combatstick 568 – our choice from this selection

And finally...

As always, Internet shopping will reveal lower prices than the quoted recommended retail prices, and a little shopping around may well be worth the time. We presume that these sticks were released to mate with CH's USB Pro Pedals, as flying solo with any of the three seemed – well, not quite right. We can definitely understand the strategy here, but to produce a device these days with no rudder input seems a little shabby. Other than that, these are three steadfast desktop controllers that should serve their purpose well.

There's a full list of CH Products' distributors for each country on their website; here in the UK it's RC Simulations in Bristol (www.rcsimulations.com). ■

Greg Gott

Downloads

Star performers from the Internet

We were pleased to be able to find a selection of files for this issue's downloads that are not solely dedicated to FS2002; there's a fine selection of aircraft for FS98 from Dana McGee, and a couple of Flight Unlimited III packages to prove that some of the 'older' sims have retained some devoted and talented developers. As well as some wonderful aircraft, there's a great selection of Yorkshire airports, and a brilliant set of printable full-colour manuals, complete with checklists. As always, we never fail to be impressed by the quality of the freeware files available and thank you again to all the authors who have allowed us to feature their creations.

As we've mentioned before, if you've designed or downloaded a file which you think is worth sharing, please drop us a line.

Not many models can withstand this scrutiny

Fouga CM170 Magister

Jet Aircraft

Flight Simulator 2002

Modelling and paintwork: Kari Virtanen and Mikko Maliniemi
Panel: Brahim Rhoul
Sounds: Mike Hambly

There's no doubt that creating an outstanding aircraft model is a lengthy process that requires a wide range of skills, from the construction of the 3D model and the programming of the panel and gauges, to the painting of the external textures and recording of the sound files; this is why we find that more and more aircraft are being designed by groups of talented people who all have different skills to contribute.

Our Star Download for this issue is a case in point, having been designed by a group of four designers who together have created an aircraft that can compete with a good many commercial products. It depicts four variants of the Fouga CM170 Magister in Finnish Air Force liveries, is accurately designed, and comes with all the embellishments we expect from FS2002 aircraft – reflective textures, transparent opening canopies, photorealistic instrument panels, and fully operational control surfaces. These combine to produce a visually and technically accurate aircraft that is a pleasure to fly. (They've even disguised Microsoft's default GPS as a Garmin 195 in one of the variants.)

All the aircraft have very stable flight models which, after reading some of the original pilot's reports, appear to be typical of the real aircraft – a fact reiterated by the number of aerobatic teams who originally flew the CM170, Including the Red Devils (Belgium), Patrouille de France (France), Esquadrilha de Fumaca (Brazil) and the Silver Swallows (Ireland).

To round off the package in style, the authors have provided a fully illustrated manual in HTML format, containing installation instructions, photographs and screenshots of both the original and FS versions of the aircraft, and also a potted history that incorporates the specifications, conception and development of the real Magister. A superb finishing touch to an excellent package.

Joe Lavery

A well worn panel (The Magister also has a fully functional virtual cockpit)

A high-speed pass through the hills

OK – Off you go for your first solo

Beautiful reflective textures

Fully animated modelling

The rest of the best... all on the Cover CD

Tornado ADV F3/21
Jet Aircraft

Flight Simulator 2002

Author: Giovanni Clemente
Panel: Marco Spada

Dassault Mirage F1C-200
Jet Aircraft

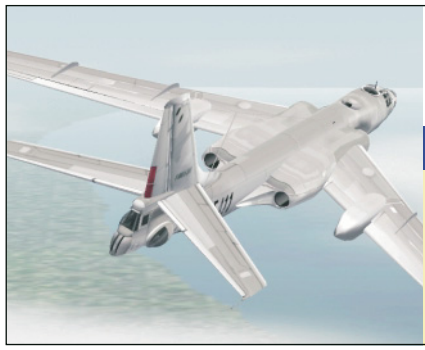
Flight Simulator 2002

Author: Kirk Olsson

Tupolev TU-95/142 'Bear'
Prop Aircraft

Flight Simulator 2002

Author: Rey Lopez



Tupolev TU-16 'Badger'
Jet Aircraft

Flight Simulator 2002

Author: Dmitry Dobronravin

Norman BN-2 Islander
Prop Aircraft Panel

Flight Simulator 2002

Authors: Jean-Pierre Langer and Arne Bartels

Yorkshire Airfields & APIs
Scenery

Flight Simulator 2002

Author: Richard Maxted

20 Manuals & Checklists
Documentation

Flight Simulator 2002

Author: Werner Schott

Various Aircraft
Prop & Jet aircraft

Flight Simulator 98

Author: Dana McGee

Dakota DC3/C-47
Prop Aircraft

Flight Unlimited III

Author: Ansgar Avermeyer
Paint/several outer textures: Erik Björnwall
Cockpit: Steve Hess
Original author/cockpit pictures: Bill Rambow

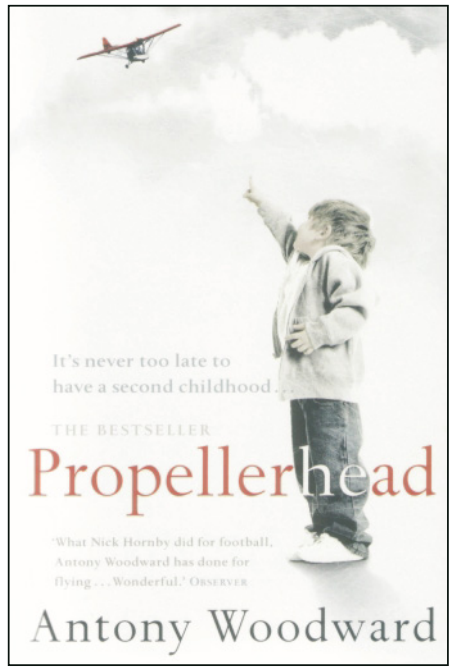
AI Traffic Enhanced
Utility

Flight Unlimited III

Author: Jouko Huovinen
3D re-modelling and re-texturing (Fokker and Mustang): Ansgar Avermeyer

Propellerhead

Flight of fancy


It's never too late to
have a second childhood...
THE BESTSELLER
Propellerhead
'What Nick Hornby did for football, Antony Woodward has done for flying... Wonderful.' OBSERVER
Antony Woodward

Propellerhead is a hugely entertaining account of how the author, an advertising copywriter with no previous interest in aviation, unexpectedly develops an obsession with flying. He becomes inadvertently smitten after noticing how impressed the opposite sex are by his friend's PPL, and the "exotic tinge of wealth and daring" it confers on him. Having found no pleasure in his lessons in Cessnas, he tries his hand instead on the lowest rung of the aviation ladder – microlights – and is immediately impressed enough to take out a quarter share in a 58hp, 500cc Rotax-powered fixed-wing Thruster.

The dismal failures, huge sense of personal achievement, and feelings of pure elation – all recounted in comically self-effacing tones – will doubtless be familiar to anyone who's been lucky enough to take to the skies themselves, and are equally entertaining for those of us whose flying is restricted to the virtual world. Accounts of his eccentric ownership syndicate, flying lessons, and first fumbling flights over the featureless Norfolk countryside give way to an all-consuming obsession with weather reports and his inability to land correctly. Eventually this leads to an ill-fated entry into the Round Britain Rally and a potentially fatal write-off. The problems of VFR flying, mechanical disasters, shambolic romantic interludes, close encounters with RAF Tornadoes, and a couple of genuinely insane episodes are recalled, alongside reflections on aviation pioneers, the wartime airstrips dotted around Norfolk and, ever mindful of the perceived outsider status of the microlight pilot, constant run-ins with 'Epaulettes', the unsympathetic airfield officials he encounters.

Rather than having the intended effect on female acquaintances, flying becomes an end in itself; it is, he writes, "the antidote I never knew I needed. In a strange way, it earthed and grounded me and let me feel real again".

Propellerhead is amusing, engrossing, inspiring, and ultimately a cautionary tale – pack a copy for your holiday reading, and don't blame us if you find yourself with a copy of *Microlight Flying* in your hands shortly after you've finished it. ■

Joe M. Besser

Review Score

Publisher: Harper Collins
Price: £6.99
Website: www.fireandwater.com
Author: Antony Woodward
At a glance: Poignant and hilarious. Recommended.

VideoFlyRec Boeing 737

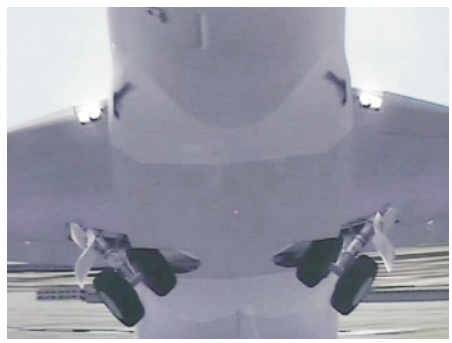
From monitor to small screen

There are plenty of aviation videos around, and many of them will take you through the procedures required to fly an airliner; you'll even find ones specific to the 737, so why bother with this seemingly expensive offering that hasn't come from one of the big names in specialist aviation publishing? The answer is that, unlike most other videos, this flight deck recording has been 'filmed' using Greatest Airliners 737-400 from DreamFleet/Flight1 and Just Flight, in Flight Simulator 2002 on a trip from Madrid to Tenerife North.

It's getting much easier to construct a movie on a PC these days, and this offering from Spanish company VideoFlyRec is as good as anything filmed with multiple cameras. The 94-minute recording takes you from pre-flight, through take-off and cruise, to landing procedures and arrival at your destination. The voice-over is in the form of a tutorial and it's very easy to follow; there's a wealth of information that explains how to start the aircraft, how the gauges function, and what everything in the cockpit does, all using 'footage' from FS2002. Time is spent going through tricky procedures such as weight calculation, and if you miss something you can always rewind it.

Although it might seem expensive, this is definitely the shape of things to come for tutorials. We would love to see something of this quality included with every add-on airliner, and the support forums would certainly calm down. If you can't get your 737 airborne after watching this video a couple of times, then it's time to swap your PC for a knitting machine. The video is available in English and Spanish, in both PAL and NTSC formats, and you can see a promotional sample of the video on the VideoFlyRec website. ■

Derek Smalls



Review Score

Publisher: VideoFlyRec
Price: $35.00 (£23.00 approx.) + p&p
Website: www.videoflyrec.com
At a glance: The ultimate tutorial – a valuable addition to the video library of every airliner fan.

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• Compatible with Flight Simulator 2002 and Combat Flight Simulator 2

It's been the subject of a host of films, but now you can witness the apocalypse and take part in the Vietnam conflict on your PC. If you want to fight as well as fly, then for CFS2 you'll also get six new AI aircraft, 50 custom weapons, drop tanks, SAM missiles, six more airbases, 30 custom missions and three campaigns. Clear the deck and get over the jungle!

Custom scenery includes eight authentic airfields using fantastic GSL (Global Scenery Layer) techniques*

Go into action with a ground attack mission from your Huey or fly one of the other 30 exciting missions for CFS2 that include a helicopter trip to get wounded troops out of the firing line and a ground attack on Hanoi

** PLEASE NOTE that weapons, missions and some other features are not available if this product is used with FS2002.*

MUSTANG Vs Fw190 £19.99

• Compatible with Flight Simulator 2002 and Combat Flight Simulator 2

As the streams of daylight bombers flew east across Europe, vulnerable to fighters and flak, they were glad of the company of their 'little friends' - the P-51 Mustangs that escorted them to their targets. Meanwhile, the finest German fighter of WWII, the Fw190, was airborne and on its way to take on the Mustangs and stop the bombers in their tracks.

Take the controls in the Mustang or Fw190 and sit in front of an authentic panel with working custom gauges or look out over a rendered virtual panel. Sliding canopies, rolling wheels, moving suspension and even working drop tanks!

Two custom scenery areas of original airfields, Bodney and Abbeville, are brought to life in exceptional detail

A whole air force of new paint schemes available to download* Use Text-O-Matic to create your own (*Internet connection required)

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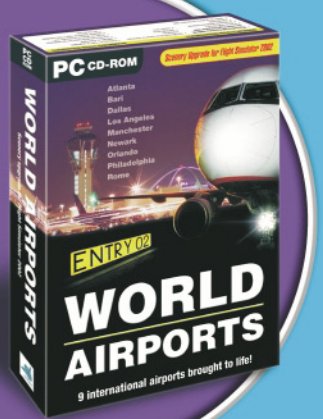

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On the night of 16th May 1943 nineteen specially-adapted Avro Lancasters led by Wing Commander Guy Gibson and crewed by the cream of Bomber Command, took part in the most famous raid of WWII on the dams that checked the waters of the River Ruhr. Their skill and bravery have gone down in history and even today 617 Squadron is called The Dam Busters. Now you can follow their exploits in CFS2 from the famous bombing of the dams with the Upkeep 'bouncing bomb' to the sinking of the Tirpitz. FS2002 pilots can enjoy the flying experience of these amazing machines and also visit the authentic scenery areas. Dim the lights and get two fried eggs on the stove!

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